EA-87-02

Ontario

ENVIRONMENTAL ASSESSMENT BOARD

VOLUME: 383

DATE: Wednesday, May 27, 1992

BEFORE:

A. KOVEN Chairman

E. MARTEL Member

FOR HEARING UPDATES CALL (COLLECT CALLS ACCEPTED) (416)963-1249

FARR & ASSOCIATES REPORTING INC.

(416) 482-3277

2300 Yonge St., Suite 709, Toronto, Canada M4P 1E4

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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental Assessment for Timber Management on Crown Lands in Ontario;

- and -

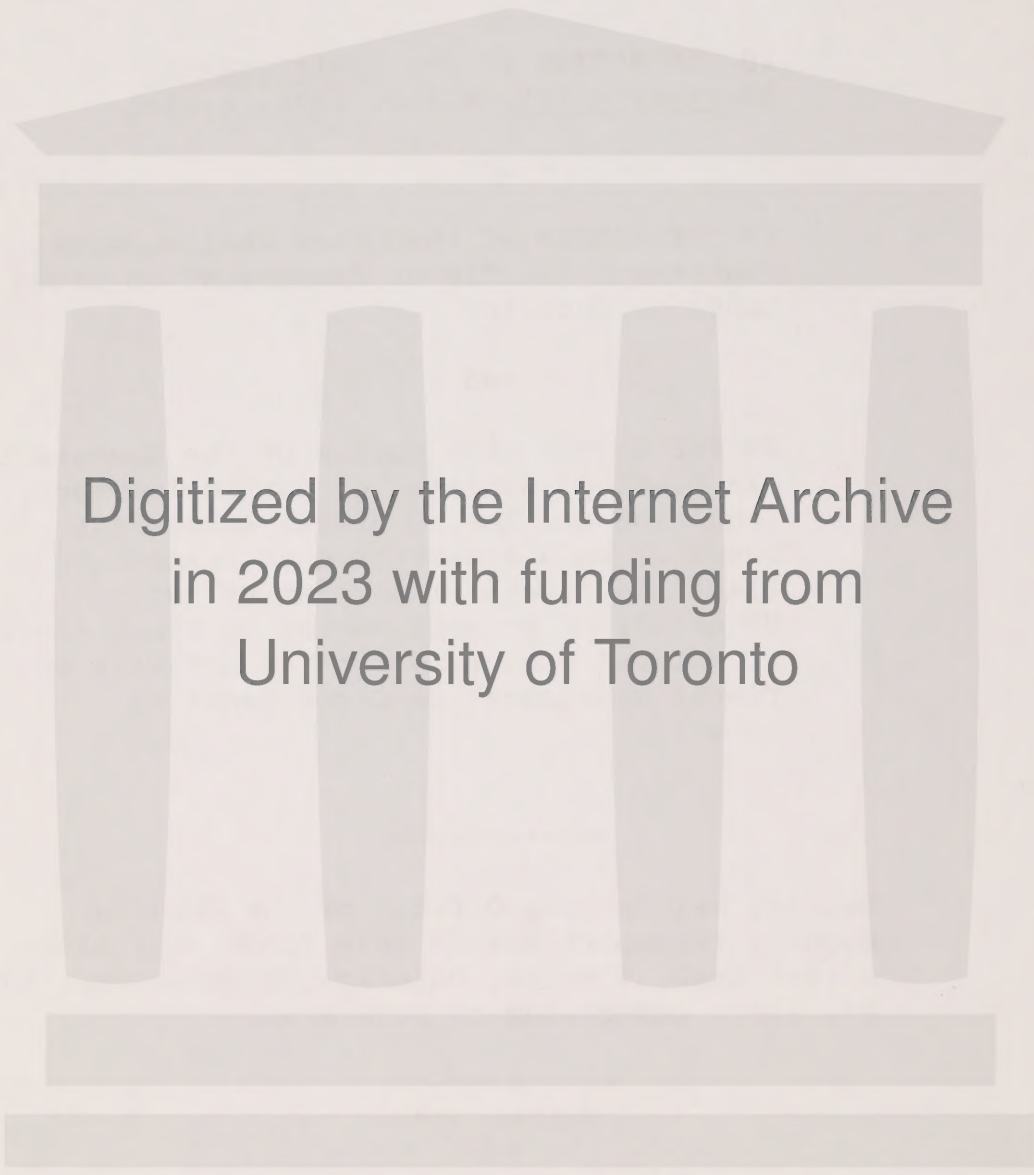
IN THE MATTER of a Notice by The Honourable Jim Bradley, Minister of the Environment, requiring the Environmental Assessment Board to hold a hearing with respect to a Class Environmental Assessment (No. NR-AA-30) of an undertaking by the Ministry of Natural Resources for the activity of Timber Management on Crown Lands in Ontario.

Hearing held at the Offices of the Ontario Highway Transport Board, 10th Floor, 151 Bloor Street West, Toronto, Ontario, on Wednesday, May 27, 1992, commencing at 9:00 a.m.

VOLUME 383

BEFORE:

MRS. ANNE KOVEN	Chairman
MR. ELIE MARTEL	Member



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---Upon commencing at 9:00 a.m.

MADAM CHAIR: Good morning. Please be seated.

Dr. Thompson.

DR. THOMPSON: Yes. Good morning.

MADAM CHAIR: Good morning. Nice to meet you. Thank you for coming to the hearing today.

DR. THOMPSON: You're welcome.

MADAM CHAIR: What we normally do is we start off by asking our witnesses if they wish to be affirmed or have their evidence sworn.

DR. THOMPSON: Affirmed is fine.

IAN THOMPSON, Affirmed.

MADAM CHAIR: Thank you, sir. And we have read the written material you gave to the Board and we will start off by assigning that an exhibit number.

Dr. Thompson's written material will become Exhibit 2240. Do you have any other materials with you that we haven't seen?

DR. THOMPSON: Not here.

MADAM CHAIR: All right. Then your statement consisting of 15 pages will become Exhibit 2240A and Exhibit 2240B will be your CV as well as your interrogatory responses.

---EXHIBIT NO. 2240A: 15-page witness statement of Ian Thompson.

---EXHIBIT NO. 2240B: CV of Ian Thompson and interrogatory responses.

MADAM CHAIR: All right, Dr. Thompson, please go ahead.

DR. THOMPSON: Okay. I thought since -- can I stand up.

MADAM CHAIR: You can do whatever you want.

DR. THOMPSON: I'll go over here. I thought that, I guess since you obviously don't know who I am, I'd like to spend a couple of seconds just telling you some of my experience.

I guess I've worked in the area of forest/wildlife/timber activities for close to 20 years now with the Ontario Ministry of Natural Resources, Canadian Wildlife Service and with Forestry Canada.

Most of my work has been at the species level but in the past, I guess four to five years, I started working at an ecosystem level which I think is the level appropriate for forest management.

My work in Ontario with the Ministry of Natural Resources primarily was dealing with the species moose. I was hired as a regional wildlife specialist in Cochrane, Ontario. I worked there for

five years. Following that I went to the Canadian Wildlife Service and I studied boreal ecosystems north of Manitouwadge, Ontario, in particular, doing research on pine marten, looking at the effects of timber harvesting on pine marten.

And then since moving to Forestry Canada I've done a number of things, but I'm virtually the only -- in fact, I am the only wildlife biologist who works for Forestry Canada and, as a result, I deal with a number of national committees on such things as integrated resource management, decision support systems and the model forest program which will be announced finally I think next month.

So I think what I would like to do is talk my slides I think is the easiest thing for me to do.

So I think that in the last decade the role of forest management agencies has changed rather dramatically, and certainly in the last four to five years, if we think of that as sort of an exponential increasing curve, in terms of the knowledge that people have had to accrue, has run the up slope in that curve; in other words, the amount of knowledge that people have had to try to assimulate in order to manage the forests properly has dramatically increased.

And I think that most agencies, including the Ministry of Natural Resources I think were perhaps either caught unaware, and certainly caught unprepared, for this sort of new role of conservation agency as opposed to managers of individual species and, as a result of that, and sort of as a result of a -- sort of a plethora of information that's become available, I think there's been a fair amount of confusion as to what various things mean.

We throw around a lot of terms like biodiversity, like old growth and like sustainable development, but I think that in general people are using these terms to perhaps mean several different things. And so I think that if we are going to start to manage the forest in a more holistic manner, which I think is the way we should go, then I think we're going to have to all try use the terms in the same way.

And I think that some of the -- I have called these myths but in fact they're just sort of mistaken semantics I believe. The first is that multiple use is the same as sustainable development. There's a sort of view out there that sustainable development is a new 1990s term for multiple use, when in fact they're very different. They're very different in philosophy, they're very different in constraint.

Multiple use is the view of the forest as several independent resources which can be managed independently, and constraint on, the development of those resources is simply the productivity of the forest or the productivity of the individual site.

Sustainable development on the other hand takes a more holistic view of the forest and views the forest as a collection of ecosystems, and the constraint on development of the forest then becomes the conservation of biodiversity or the maintenance of those ecosystems through time. And so sustainable development and multiple use are philosophically very different.

A second, what I call forest management myth, is that diversity is the same as biodiversity. And, again, these are very different things. Diversity is the site concept - we talk about the number of species and the numbers of individual species that occur on an individual site - and this is not biodiversity: Biodiversity is the structure, function and composition of genes, species and ecosystems; in other words, all forms of life and all variants of forms of life that occur on a particular forested system.

And I don't know how many times I've been

told by forest managers that if we log in old forests that we're going to increase the biodiversity. That's not true. You will change the diversity of the site, but we will have done very little in terms of the biodiversity that occurs within the forest because the forest is a changing entity and so all you're really doing is altering the diversity on that particular site you're logging.

The third one seems to be a contentious issue in Ontario and I hadn't realized how contentious old growth is, but I consider old growth in boreal systems also to be a myth. Old growth is a term which, in my view - and I've got another graphic after this to talk about this - but old growth is a term which refers to a particular forest type which develops and maintains what is called a steady estate mosaic; in other words, the volume or the total timber available per unit of land doesn't alter much once the forest has reached an old stage, and so old growth goes on for an extended period of time, often several hundreds of years, whereas in the boreal forest a catastrophy-driven forest, old growth I think is an inappropriate term. It would be far better off to use mature and overmature to deal with that relatively short window of time when the forest has stopped

putting on volume and is, in fact, declining in terms of the total volume per unit area.

And I think to confuse old growth - which is largely a term which should be applied to temperate rain forests, for example Amazon rain forests, possibly white pine forests - and I think to confuse that term with what goes on in the boreal situation I think leads to a number of false conclusions.

The fourth one is the old chestnut or the old paradigm that clearcutting is the same thing as fire; in other words, if we clearcut a forest basically we do exactly the same thing to it as fire would. I disagree very strongly with that and I disagree for several reasons.

The first, is there's a substantial amount of site disturbance with logging, whereas fire does not disturb the site in terms of actual destruction of the soil and broad-scale destruction of the processes associated with the site.

Secondly, logging removes all stems from the site, whereas fire does not. Fire often leaves residual stands, it jumps across the landscape; clearcutting tends to be a progressive movement across the landscape and removal, as I said, of all stands.

And I think Dr. Carleton yesterday

probably talked about some of the difference in process that occurs after fire and after clearcutting.

So, in other words, the way in which the ecosystem assembles itself after the disturbance is, in my view, very different after fire as it is after logging. And so if we're altering the ecosystem assemblage processes, then we are undoubtedly altering the biodiversity of the site.

There are substantial differences in the structure of the forest after logging, as there is after fire. In particular, the number of dead trees standing and the number of the structure of the forest floor, very different after fire as opposed to after logging. So I think it's a myth to suggest that clearcutting and fire are equivalent.

But as I said in my witness statement, I think that we can learn from the way in which fire moves across a landscape and perhaps change the way in which we conduct our forest management more closely to limit natural disturbances. I don't think we do it now, but I think it can be done, I think we can learn from it.

A fifth myth that I've highlighted here is that the habitat of the species is the same as the population of that species; in other words, if a

particular species needs a particular kind of habitat and the habitat occurs there, then sort of ipso facto the species is also there.

And I think that this is something that biologists have come to believe in over a period of time. When I first started doing biology we used to go out and count everything, that is what we did, we sort of zipped around in airplanes and counted moose and counted caribou and counted duck and so we knew the populations were there.

Well, since that time we have come -- I think the pendulum has swung very much in the other direction, so now we manage for habitat. Everybody is now a habitat manager and the assumption is that if we manage for habitat the species is going to be there.

That may be true, but we clearly need monitoring systems to ensure that that, in fact, does happen. So I think that when we develop our new management paradigms in the forests, clearly a monitoring system must be part of that package.

The final one, what I consider to be sort of a general myth, is that the second forest, the post-logging forest is going to be equivalent to the natural system. This very much gets back to clearcutting is equivalent to fire. I think it's an

implicit assumption in all of our forest management that what occurs after we manage the system will result in equivalent populations and species and ecosystems as were there originally, we ought not to worry about the loss of biodiversity.

That may be true, but I suspect that it isn't, and I'll show some more slides after a while to show some of the work that I've been doing with the land to test that hypothesis.

This is a graphic to illustrate one of the myths, that I think that we ought to not confuse old growth forests with mature and overmature forests in boreal situations. This graphic, both the axis is the same volume, which is total amount of timber per unit area, age across the bottom. In the boreal forest being a catastrophy-driven forest, the stand grows, it is disturbed in some way, it declines in total volume and then grows again.

In what has commonly been called an old growth forest, in particular in temperate ecosystems such as rain forests and Amazon rain forests and so on, old growth forest is a more apt term because the forest survives for an extended period of time and becomes a forest that is known as a steady state mosaic which is driven by gap dynamics. In other words, individual

trees or group of trees die over a period of time and other trees come up within these gaps in the forest.

That's a very different situation to a boreal forest which is a catastrophy-driven forest where large expanses of timber die simultaneously as a result of fire or insect infestation or perhaps even logging.

So I would prefer it if we stayed away from old growth in terms of boreal forest because it's not just -- it connotes different things in peoples' minds what an old growth forest is, the values associated with old growth forest, compared to what people think of when they think of a mature forest or an old forest which is in the state of decline.

With regards to fire and clearcutting, this is sort of a standard kind of clearcutting situation that we find, the road leading up to the mill, progression of clearcuts away from the mill. This is in fact in your Kapuskasing -- immediately south of the Kapuskasing.

Now, compare that to a fire, in this case an area near Elk Lake. The important thing I think to notice here is the legacies that are left as a result of fire; in other words, green areas that didn't burn. The way in which fire behaves is substantially

different than the way in which we log the forest.

This area is totally killed and might be equivalent to the way in which a forest is logged, however, it's relatively small compared to the whole burn. Within the burn there's a number of small areas, islands, that didn't burn. These legacies are very important for the way in which this ecosystem redevelops over a period of time. If this forest was logged, all of this stuff would be dead simultaneously when, in fact, that doesn't occur in the natural system.

And so if we are going to manage a forest, then I think that we ought to pay attention to the way in which the forest is normally recycled or redriven from an old stage to a young stage, and this is what I meant earlier on when I said that I think that we can modify the way in which we model the forest using natural disturbance as a sort of model for the way in which we model forests.

MR. MARTEL: Yes. That sounds like it's easily said, but how do you determine the areas, for example, that fire would occur and what you're going cut, how do you determine -- why do certain spots get left behind during the fire and they jump?

I mean, there's water, there's a variety

of things, but how do you develop a pattern that you could apply then to where you're going to do the harvesting that's similar to what nature would do?

DR. THOMPSON: That's a good question and I think the way you do it is through a research program which focues on the differences between clearcutting and logging. I think you do it through a research program which does that at two scales; one at a broad spacial scale - and so we can compare using remote sensing techniques and using spacial statistics the average size of patches that are burned, the average size of residuals that are left, differences between them - and then at the site level we study the role that these legacies play, the size that the legacies are, the species composition these legacies are.

So I'm not saying that we can go out and do this tomorrow, but I think that we can do it. I think that with the proper research which focuses on that question I'm convinced that we can do that and, in fact, I'm trying to start this kind of research now.

MADAM CHAIR: Dr. Thompson, the Board has received a great deal of statistical information about fire history in Ontario and we haven't drawn any conclusions about that, but essentially you could arrive at lots of conclusions, looking at that fire

data you could look at it and say: Well, what's really happening in here, or we should have small clearcuts because that's mimicking the fire pattern.

DR. THOMPSON: Oh no.

MADAM CHAIR: Or we could say, on the other hand, we can have some vast clearcuts because some huge areas have been essentially burned out by intense fire.

DR. THOMPSON: Mm-hmm. The correct answer is all of the above. You need a range. In fact, let me show you the next slide here.

This is dealing with an ecosystem that we have in Newfoundland. This ecosystem isn't driven by fire, it's driven by insect infestation and so areas of the forest are killed by insects. And this is the evidence that I have presented in my witness statement where if we went out and looked at the distribution. This just looks at size distribution now, which is one of the questions of course that we're dealing with: How big should clearcuts be.

Well, the answer to that is there should be a range of sizes and there should be some really big ones, but there should be an awful lot of smaller ones as well. This sort of distribution we find again and again in natural systems, negative exponential

distribution.

And if you look at, for instance, the way in which this same ecosystem is being logged you find it's dramatically different and, as a result of that, the processes which result in regeneration of the system must necessarily be different.

And the reason for that is because the way in which the species which were normally associated with that forest move into the forest out of edges and legacies that are left. As a result of the insect infestation, the effective radius away from these edges and away from these legacies is dramatically reduced as a result of a large number of larger than normal kind of disturbances going on.

And I think that we can do the same thing with fire. One of the difficulties that we will have with developing a model for fire, of course, is that ever since 19 - whatever it is in this province - they have been dumping water on fires, and that becomes a real problem.

And I think that's going to be a bit of problem, but I think also that we can get at that through two ways: No. 1, by looking at old aerial photographs and old databases which show fires which, in fact, were caused by natural causes and were unable

to be controlled. And so we have some idea of the kinds of distribution of sizes - and, for example, I can think of a couple. There is one -- there's actually two in Pukaskwa Park, both of which burned in approximately 1930, 1935 - those kinds of data exist.

There's also the area so-called north of, whatever it is, north of Pickle Lake, north of Red Lake and so on where we haven't controlled fire.

And so those areas I think provide us with some data to start developing these kinds of models for the way in which fire moves across the landscape and for the sizes of fires which would naturally occur.

MR. MARTEL: But you go beyond fire then too, Dr. Thompson.

DR. THOMPSON: I beg your pardon?

MR. MARTEL: You would go beyond fire. If you were doing this, you would have to incline infestation; would you?

DR. THOMPSON: You may have to. There's --

MR. MARTEL: I mean, if you're going to replicate nature, how do you leave two elements out, both of which control to some degree if you desired?

DR. THOMPSON: I don't think -- the

answer is, I don't think it matters. There's a synergistic interaction between insects and fire anyway which may be positive and may be negative in terms of the size of the fire. In other words, if the area is infested with insects and dies and burns within a relatively short time period, then we get very hot, very large fires; however, if the area is infested with insects and does not burn or starts to burn later on after a period of only eight years or so, then the fire is no longer as hot and doesn't burn as large. But the point is that there is a mixture of those kinds of fires across the landscape.

And so in terms of development of the model, I don't think it really matters how the fire originated and I don't really think it matters whether you're infested by insects in the first place. I think that in terms of the development of the model what you want to know are: What is the range of sizes that occurred, what is the range of intensity that occurred, what is the range of biological legacies that are left within these fires and what are the ecosystem processes that are different after clearcutting as opposed to after fire, and I think that if we work towards developing these models then we will have a much better model for managing the forest when you do that.

MADAM CHAIR: Excuse me, Dr. Thompson, but with respect to managing the forest, are you talking about anything other than the variable clearcut size?

DR. THOMPSON: Yes.

MADAM CHAIR: What, for example?

DR. THOMPSON: For instance, the size and species composition of legacies within clearcuts in other words, or within fires for instance that are left. I'm talking about the way in which we distribute logging across the landscape, and I'm talking about the way in which fire behaves in different ecosystem types because that is very different. For instance, fire in a jack pine system is very different in the way it behaves compared to fire within a boreal mixed wood system.

And so if we are going to do this kind of management and work towards a more natural means of regenerating the forest, then we must I think -- we must be very cognizant of the way in which natural disturbance affects all ecosystem types. It's much more than just size.

MR. MARTEL: But you would drive the public mad if you were decided that we had an area that had to be 7,000 hectares there that must go in some way

to replicate nature, you'd have people going absolutely bonkers because that's one of the things they dislike now.

DR. THOMPSON: I realize that.

MR. MARTEL: They think clearcuts are far too big, and we have heard that more frequently than any other complaint in this hearing.

DR. THOMPSON: I know, but I think it's a mistake to listen to that.

MR. MARTEL: Well, you tell the public who own the land that it's a mistake to listen to them.

DR. THOMPSON: Well, I mean, let's think about the consequences of going out and making a lot of small clearcuts on the landscape.

If large clearcuts are bad, and the way in which they're done now I agree is perhaps not the best way to do it; then small clearcuts probably, at the other end of the spectrum, are equally as bad because they in no way mimic natural processes in the way in which the boreal forest develops.

And if you want to regenerate the boreal forest in some sort of natural system way, if you want to regenerate the natural forest in terms of the ecosystems that are currently there, then the way not to do it is to go out and log in small patches, because

the boreal forest is not driven in that way.

If you were talking about Pacific northwest old growth forest, then I would agree that's the way to go, we go with 10-hectare clearcuts because that's the kind of past that forest is driven by.

If we're talking about boreal forests where, in fact, there some tremendously huge burns, sometimes 100,000 hectares, then that's the way we ought to be managing that forest.

Now, I'm not suggesting - hold on - I'm not suggesting we go out and cut 100,000 hectares. First of all, it's logistically impossible. Second of all, you're right, the public would never ever agree with it.

But it's very important I think that we look at the range of sizes of disturbance that would normally occur within these ecosystems if we want to ever bring these ecosystems back.

MR. MARTEL: How long is that away though, to take those patterns, to develop those patterns and say: Well, this is the type of -- we have to make a decision in the next -- well, if we ever finish this hearing.

DR. THOMPSON: You've only got two days.

MR. MARTEL: Two days left, but then

we've got to make decisions on how -- I mean, there's so many questions left because all of this new stuff is being added since we started and we've got two parties coming forward us now who want us to do landscape management, I'm not sure what it really means yet --

DR. THOMPSON: Well, I will tell you what it means.

MR. MARTEL: And certain parties at this hearing are saying: Well, you can't cut any bigger than this, but that could interfere with the size of the area in the landscape that should be cut, according to whoever you're talking to.

DR. THOMPSON: Well, look at natural reserves in Newfoundland. I mean, if you went out and you decide, for instance, that you're going to do 100-hectare clearcuts, that's the maximum size, well that means that all of these natural kinds of openings that would occur in the forest aren't going to be there, and what you're going to do is you're going to force the forest to always be a hundred hectare forest, that's what you're going to do and that's not the way the system develops, that's not way boreal forests develop.

Boreal forests develop over broad areas, they don't develop over little tiny patches, and if you

go out and use cook book forestry by saying that in jack pine and in upland black spruce and lowland black spruce and in boreal upland mixed woods we're going to have a clearcut size of 200 hectares, you're going to destroy the system.

MR. MARTEL: Pardon me for chuckling, but having listened to four years of evidence here the range of ideas is quite -- or what we should be doing is quite unbelievable.

DR. THOMPSON: I'm sure it is.

MR. MARTEL: Because some of the material that has been presented is very site-specific and only certain sizes and, as I say, in the last moment we have got the initiatives by the Minister to talk more about landscape management and, I mean, it is just almost mind boggling as to -- that's why I lead with the question, how long would it take to develop the sort of patterns, because people want things in the next two weeks.

DR. THOMPSON: I know they do.

MR. MARTEL: To develop this sort of model to try to get at the patterns that would make it possible to do what you're suggesting has to be done.

DR. THOMPSON: I know.

MR. MARTEL: And how long would it take

those models. They're not around the corner either; are they?

DR. THOMPSON: They're not that far away. I mean, the piece of research that we are starting to do now with Forestry Canada which I think will give us these answers. I think we can have them in three years, that would be my guess, in association with a number of other pieces of research which will look at the role that these legacies actually play, these stands, these islands that are left, the species composition and so on, that kind of information may come later.

But in terms of the development of the actual models, my guess is three years is probably reasonable, especially if you get your mind on the same problem. I mean, I will argue until I'm blue in the face that cookbook forestry is just not going to work, not in the boreal forest.

That really is what we just talked about, what I see as the research priority over the next period of time in terms of the major question of how we preserve biodiversity. And the way we do that is by studying biodiversity and all of its ranges of forms in association with post-logging forests and compare it to natural disturbance regimes.

That's the kind of thing, that's the kind of research program that a research branch ought to be doing now, because by answering this -- this is our sort of broad guiding question, do we do it at an ecosystem level or a stand level, then ultimately we would get to the kinds of answers that we would need in terms of the way in which the forests should be managed.

We've started doing some of this in Newfoundland in the balsam fir ecosystem that I described earlier which, as a result of the Maritime climate, it rarely burns and it's an insect-driven forest.

This is an example of an old forest in Newfoundland, pretty small trees but, in any case, this is an example of an old stand natural origin in Newfoundland. This is an example of an old second growth stand in Newfoundland. The first one I showed you is about 80 years old natural origin, this is post-logging stand that's about 60 years old. So they're actually quite close in timber, and this is an awful graphic, but I just wanted you to look at the top.

MADAM CHAIR: Which slide number is this, Dr. Thompson?

DR. THOMPSON: Which slide number is this?

MADAM CHAIR: Has anybody been keeping count?

DR. THOMPSON: No, but I'll tell you.

MR. MARTEL: I have tried.

DR. THOMPSON: This is No. 11.

MADAM CHAIR: Thank you. Do you have hard copies of this material to leave with us?

DR. THOMPSON: Yeah, I think I do. Actually I think I may have it; if not, I can give it to you.

MADAM CHAIR: All right. Why don't we leave Exhibit No. 2240C as a copy of Dr. Thompson's slides.

---EXHIBIT NO. 2240C: Hard copy of slide presentation of Dr. Thompson.

DR. THOMPSON: Okay. This graphic is awful, it takes some explanation.

The only one you really probably want to look at is the top one, and I want you to think about the graph as looking -- standing at the edge of this forest and sort of seeing well into the forest.

And so what we have then is in bars. The first bar in each of the groups -- what we have is

three groups, the first group is natural origin forest which I called old growth at the time because I had no name really thought of, but this is mature/overmature forest, trees, small trees - in other words sub-canopy - shrubs - in other words ground covers - and dead snags or dead trees.

This is the second growth post-logging forest, and the question we are asking here is: Is the structure of the forest the same after logging as it is after natural disturbance. And so we got out and we measure the forest, the canopy, the sub-canopy and the ground and the ground level and the deadwood.

And if you think about looking into the forest, trees, small trees, shrubs and the deadwood and you can see there are substantial differences between natural origin forests and second growth post-logging forests in terms of the forest structure.

And so I don't know the answers yet as to why that is, I think that we will find the answers, but the important point here is that they are in fact very different. And so if the structural diversity is different, then the way in which animals perceive this as a habitat is also different.

And, in fact, when we went in and measured some bird species that were -- or we measured

the diversity of bird species that were living here and compared them to the bird species that were living here, there were many species that were the same, there were some species that did better here and some species that did better here, but the important thing was that there were several species which were absent from this forest, we never found them.

And so the rule of that then is that the way in which the ecosystem is assembled structurally after logging appears to be very different than the way it was after natural disturbance, in this case, hemlock infestation by spruce budworm.

And so I think these are -- I think that's a very important kind of point, that the way in which that forest was logged did not, so far anyway as we've been able to ascertain, mimic the way natural disturbance affected the site.

When I talk about forest management and the need to look at ecosystems, we also need to look at the ages of those ecosystems on the landscape as well and the thought of moving to a short-term rotation forest, I think, does not go well for species which require the mature and overmature stages of the forest.

Pine marten are an example. These are sort of data that we gathered at Manitouwadge which

showed sort of a per cent carrying capacity of numbers of marten that can be maintained by that forest, and what we found was that as the forest aged marten did a lot better; in other words, the populations were much higher in older forests.

And the reason for that is because as the forests ages it develops a number of structural components which aren't there in younger forests. The result of that is there is a number of niches created in the forest, these niches are occupied by a number of species of small mammals. The total biomass of prey that's available to the marten increases and, as a result, animals do much better in old forests.

I have another graphic here that shows some of the actual data with regards to how the animals were using old forest compared to successional forest.

One of the first things was that the males' home ranges were substantially larger in successional forest; in other words, in order for these animals to make a living, the area that they had to use sort of on a weekly kind of basis was substantially greater than it was in old forests.

And one of the results of that was that they spent more time crossing open areas, and when they crossed open areas they were killed by various

predators, not all of the time and not all animals died, but the rate at which marten living in successional forests were killed by predators was substantially higher. And so this is one of the reasons then why marten do better in older forests.

There's a number of other things I think that we can look at. But one of the probably -- what was shown in the other graph is illustrated here and that the total density over the forest was approximately 10 times greater than what we found overall on average in successional forests.

And so when we're managing for our ecosystems and when we're managing for forests, it's necessary to have a range of ages within each of these ecosystems in order to maintain the species and the biodiversity that is associated with each of these niches. And so if we truncate our forest age at, say, 80 years or 60 years, then I think we're going to have trouble in terms of maintaining the biodiversity that is associated with the older age-classes.

Still on marten, I'm looking at a very bad management scenario in the Province of Newfoundland. I want to talk about the kinds of problems that you can get into by not managing at a landscape level, and by managing at a landscape level

what I'm referring to is a very broad scale, maybe 5,000 square kilometres per management unit, but that management unit is placed in context with other management units around it.

So that we may think, for instance, of landscape, perhaps all the northern peninsula and all of the west coast, for instance, as our landscape, the area in which we would have to manage contextually. By not doing this in Newfoundland, you can see the amount of uncut forests that's left, it's quite minimal, it's less than 10 per cent of the province, in fact it's probably down around five per cent.

All of the other forests have been logged within the last 50 years and so they're relatively young. The old forest suitable to marten in the Province of Newfoundland is here and here, and so we have an age-class structure of the forest that looks something like this, this is for one management unit, but it's not peculiar, it's quite common to the entire island.

The amount of forest that's in young age-classes is tremendous compared to the amount of forest that's in the old age class. Marten exist only in the old age-class, and the result of that is that our population of marten in the province now is

probably less than 200 animals, we're talking dangerous rates here now. These animals will undoubtedly, in my view, go extinct.

The reason for that is that we didn't manage the landscape well enough and it will probably, in my view, based on this modeling exercise that we did, will probably go extinct some time between the year 2030 and 2070, and that's because we didn't manage the landscape well.

So I think that as we move towards, or as we try to move towards a more holistic way of managing forests, I think that we have to start to understand ecosystems a lot better than we do and that we have to apply broad conservation goals as opposed to managing for each of the species alone.

The implicit assumption of course of managing for featured species is that by planning for featured species that we are also managing for everything else that's out there in the forest, and I don't think that that's necessarily correct.

And that's the major difference I think between multiple use and sustainable development. If we are going to develop our forests in a sustainable manner, then we must have goals for biodiversity, that means our broad conservation goals. And if we don't

understand ecosystems, then I think our management efforts will become simplistic and we will end up with a number of unintended consequences for the species for which we are managing. And I'll give you a good example of that.

Initial early attempts at managing for spotted owls in the Pacific northwest were basically leaving spotted owl hotels, hundred hectare plots in which it was thought that the animals would nest. Well, they did, they nested in them, but what actually happened was so did a couple of other species of owls which actually were predators of spotted owls, and so we ended up with all of this spotted owl habitat with no spotted owls in it and it's because we didn't understand the ecosystem and applied an inappropriate management technique to try and maintain species that were associated with older parts of the ecosystem or older age-classes in the ecosystem. And so we have to understand the system in order to manage it properly.

This is what I was talking about earlier with regards to the kinds of removals that we might do in the forest. This is the slide that I used to illustrate how you might be able to manage for marten sort of in a crisis stage, but it doesn't matter what the slide is actually for. What I think it illustrates

fairly nicely is, for boreal systems this is not the kind of way in which we would log the boreal system by removing small patches across the landscape.

And the reason for that is because the forests develop in this way, relatively uniformly, plus or minus 20 years in age over a broad area; it didn't develop this way, where we cut here, and five years later we cut here, and five years later we cut here, and 10 years later we cut here and so on.

This disrupts the way in which the ecosystem is assembled, so you're far better off to do this kind of system here, this kind of system here, but in a way which mimics natural disturbance.

I guess the only reason I included this is because I see this as sort of gradation in the way in which we should be managing, or the way in which people thought about how to manage for wildlife in the forests, and we've gone from featured species - well, actually most provinces in the country are still managing for featured species, whether these are species of economic interest or rare and endangered species - people are starting to think: Well, how can we manage the forest and they've gone to things like indicator species, multiple habitat supply indices for various species, thinking about guilds - these are

groups of species which all more or less do the same sorts of things, have the same sort of ecological requirements - moved on down all the way now to where people are thinking about ecosystem management which is basically the take-home message that I'm trying to emphasize here, is the level where we ought to be.

And if we manage for ecosystems, it doesn't preclude management for featured species. In other words, if there is some reason to protect an individual species or if there is reason to enhance the habitat of a particular species either for economic gain or for recreational gain, it doesn't preclude doing that by using an ecosystem management system, it just means that you may not do it at the same location or you may not do it through all times at the same location, but within the system you can still do featured species management.

In terms of recommendations for forest planning, I think what we need is a continous and predictable supply of timber. Clear objectives for biodiversity, we must be setting objectives for biodiversity and these objectives for biodiversity will be set in certain cases for some species, in certain cases for groups of species, but for certain they will be set for ecosystems at the landscape level and the

maintenance of ecosystems through time; in other words, temporally and spacially, this is how those objectives must be set.

There may be objectives for featured species, as I said earlier, and in setting these things we have to obviously be very careful about making certain that the conditions in terms of forest extraction are still operationally workable.

In other words, we talked earlier about these very large clearcuts. Well, if we can't do them, then we can't do them, there's no sense in suggesting that we do them. But the point is, I think when we're doing this, that has to be part of the way in which we think.

We need auditable results; in other words, when we set these objectives we must have a monitoring system in place to determine that we are, in fact, meeting those objectives and the whole system has to be adaptive. If we find that what we're doing results in that we're not meeting a particular objective, then we need to find out why and change our system. So the results must auditable.

We clearly need a mechanism for public input and a mechanism for public input, I think, must be the same regardless of where you are in the

province. In other words, we can't have different ways of having public input. I think everybody has to have a chance at it, but it has to be the same sort of chance.

We need to spend a lot of time developing decision-making systems and in developing tools to do this system. If we are going to be managing at the landscape level, then it's very difficult to get your mind around the problem, and the way to get your mind around the problem is by developing decision-making systems, modeling systems which integrate, modeling systems for harvest assessment, modeling systems for silvicultural assessment, modeling systems for forest/wildlife interactions in the system. All of this has to link to the geographic information system.

MADAM CHAIR: What is DSS Dr. Thompson?

DR. THOMPSON: Sorry, that's decision support system. I will tell you, these are just some of the kinds of tools that people are working with or need to be refined.

Decision support systems, these are basically models which help us to ask the what if question: What if do this, what if we do that.

Habitat supply analysis, this is landscape level examination of particular habitats

through time. Forest ecological classification. Ontario's one of the leaders in this area and it's one of the system, one of the main cogs of the new management system that I think we have to move to. And habitat supply indicators, those are indicators for individual species that you may be modeling.

I have already talked a lot about this, but on the broad area of Ontario we must do what is called integrated resource management, and this implies that we manage all resources from the land base through objectives which exist for those resources.

We need an inventory for those resources, and I'm not suggesting we go out and we count all the species of butterflies, how many they are, but what I'm suggesting is that we look at important ones, and what I'm suggesting is that we definitely must know what ecosystems are out there, their spacial distribution and their temporal distribution.

And, as I said earlier, we need to make sure that we have some kind of monitoring capability to ensure these objectives are met, and I think that there's nothing wrong with stratifying the land base, in other words, to do this. I think that the only way we can accomplish all of these things and still have a viable timber industry is to stratify the land base in

some way.

And by stratifying I would suggest there's three main categories. The first is in areas - and I don't know how to decide, well, I guess I probably can think of some ways to decide - but you would set up some criteria as to areas that would be used for intensive forestry. The reason you would do this is to provide timber in areas that are relatively close to the mills as quickly as possible - and I know this is perhaps a contentious issue but that's the side of the fence that I'm on - and on those areas we would do intensive forestry. The pie represents the entire boreal forest.

The second area would be ecological reserves, and within ecological reserves we wouldn't do anything. These would be benchmarks for ecosystems, they would allow us to understand the way in which the forests naturally assembles, they would allow us to understand the way species interact within those areas.

And in the broad area we would do integrated resource management; in other words, we would have objectives for timber and we would have objectives for biodiversity and broad conservation objectives.

But the important thing is to not think

of ecological reserves as mature, overmature and old forests because the boreal forest grows and dies, and so that on this area the red and the yellow at any point in time they would be managed in context - and I'm using manage in sort of the most broadest possible context here - to suggest that if these were set up originally as old forests and they're not old any more because they burn or because the insects got them or they died naturally, then the old forest would be over here somewhere. And so all of this has to be put in context.

And so in summary then, I think that we should move away from the featured species system to manage the forests in a more holistic manner based on ecosystem classification and based on maintenance of these ecosystems in time, and that we set goals for biodiversity and that these goals be audited and that our system be adaptive and. In other words, if we fail for one reason or another, we find out why, we go back and we change our system.

That's basically what I have to say. If there's any questions, I guess...

MADAM CHAIR: Will you have any questions, Ms. Blastorah?

MS. BLASTORAH: I'm not sure whether Mr.

Lindgren or Mr. O'Leary --

MADAM CHAIR: Hi, Dr. Quinney. Hi Mr. O'Leary. Nice to see you again.

DR. QUINNEY: Good morning Madam Chair, Mr. Martel.

MADAM CHAIR: Are you going to have any questions for Dr. Thompson?

MR. O'LEARY: No questions, Madam Chair.

MADAM CHAIR: All right, thank you.

Ms. Blastorah?

MR. LINDGREN: We have no questions.

MADAM CHAIR: Oh, Mr. Lindgren. I'm sorry.

MR. LINDGREN: We have no questions, Madam Chair.

MR. MARTEL: No questions on cut sizes. I just thought I would ask that.

MS. BLASTORAH: Madam Chair, if I could have five minutes I would have possibly very few questions, and I could probably move through whatever I may have more expeditiously if I could have a couple of minutes.

MADAM CHAIR: That's just fine. Do you want to take a 10-minute break.

---Recess taken at 9:50 a.m.

---On resuming at 10:10 a.m.

CROSS-EXAMINATION BY MS. BLASTORAH:

Q. Dr. Thompson, I just have a very few questions for you. You had a discussion with Mr. Martel during your presentation about the rapidity with which a move can be made at an operational level to a more landscape approach to forest management, I think was the term you used.

And you did, in response to Mr. Martel's questions, indicate that you were beginning some research with Forestry Canada which will provide some answers within three years. And I was just wondering if you could clarify for the Board what the product will be within that three years or after that three years?

A. Yes. What we are aiming for is to provide a landscape level comparison between the way in which the landscape is altered as a result of logging and the way it is altered as a result of natural disturbance, and so we tend to use a number of spacial statistics to give us the range and sizes of disturbance, the sizes of legacies that are left, distance between edges and, as I said, a number of spacial statistics to quantify those kinds of things so that we would be able to then say what the differences

are at the landscape level between natural disturbance and between logging and to hopefully provide some kind of a prescription for the way in which clearcut logging, at least at that scale, can proceed across the landscape.

Q. Am I correct then that when you say at that scale you are not implying that you could, as a result of that research in three years, tell a unit forester at the stand level--

A. That's correct.

Q. --or at the management unit level.

A. That's correct. The stand research will be done concurrently but I don't see answers at the stand level coming before five years.

Q. And am I correct that some research that would be necessary in order to move in this direction would be, for example, the development of an ecological land classification system?

A. Where it doesn't exist, yes, or for where it does exist, to test the ability of that land classification system in operational forestry.

Q. And the development of models was another issue that you discussed at the landscape level I think.

A. Yes.

Q. And you would agree with me that it would be necessary to validate any models that you develop?

A. You would test the model, that's right.

Q. And that would require additional research and data?

A. It would require a certain amount -- it would require a certain amount of time, yes, to do that. I would hope though that during that sort of three-year period that we foresee here that we would hopefully have some testing done during that time period.

Q. And you indicated as one of the points you made about -- the important point I think you characterized it as something like important points to consider in moving towards more holistic management, and one of the points you made was that it's important to consider operational -- to take into account operational considerations?

A. Yes.

Q. And I think the example you gave was that it's not feasible for the forest industry to go out and do huge clearcuts all at once just at the operational basis?

A. I think that's correct. I'm not an expert on how fast an area can be logged.

Q. Would you agree with me that as research produces better information on landscape patterns and there is a movement toward attempting to more closely mimic those patterns on the landscape that it may take some time for industry to adjust to how practices should be conducted in order to follow those patterns?

A. Yes, and it would also -- the amount of time that would have to be spent in drawing up a logging plan for a particular area would increase markedly because you have to have a much more in depth knowledge of the area that you are logging than is currently the case, and that's currently the case that results from simple area typings using aerial photographs.

MS. BLASTORAH: Those are my questions. Sorry, Madam Chair.

MADAM CHAIR: Just one follow-up question. Dr. Thompson, do you believe that in the field now when foresters are planning areas that will be harvested that they are now following some of those patterns; in other words, we have flown quite a bit through northern Ontario and you can see fire origin

stands very clearly, you can see where there has been insect damage, there are demarcations on the land that, in some cases, are fairly obvious and cutting patterns are done on that basis now to some extent.

Would you agree with that, or do you think those patterns are being entirely ignored, and I'm not talking in a large landscape context, I'm talking by stand?

DR. THOMPSON: You're talking about site-specific.

MADAM CHAIR: Yes.

DR. THOMPSON: I don't think they're necessarily being entirely ignored, I think that in many cases that kind of thing does go on, for instance, salvage operations in Newfoundland, for instance, these are areas that are killed like hemlock looper, wild fire salvage.

But I suspect that it's more by serendipity than by plan, that's I guess the point here. In other words, there is no view to the maintenance of ecosystems in doing that, it's simply a recognition of the fact that all of this timber is a particular age-class and so we're going to take it out.

MADAM CHAIR: Yes, I agree with that but, at the same time, there may be no magic with respect to

the research you're coming up with that may -- there may be very good clues now as to the kind of stands that exist on the landscape and how they should be managed?

DR. THOMPSON: I think there's very good information on the kind of stands that exist, I think there isn't particularly good stand information on how a stand should be managed.

When I said that in some cases that we should remove large areas simultaneously, I didn't mean that we clearcut in the way in which we do now. What I meant by that is that we should harvest them in a way that more closely approximates the way in which a fire would move across the landscape; in other words, we do leave some legacies areas that are unburned, we do partially remove some trees from some sites, we do leave snags, we do leave timber in low lying areas which would normally not be burned, those kinds of things.

And so it's not complete removal of stems. You leave advance growth, as another kind of thing you do.

MADAM CHAIR: And, of course, that sort of thing is being done?

DR. THOMPSON: Not --

MADAM CHAIR: We've seen some examples, I'm not saying that's being done all the time.

DR. THOMPSON: I think there are some examples of it and I think there are some examples of good forestry to be found in Ontario.

MADAM CHAIR: A typical situation that Mr. Martel and I would see, and anyone would see when they're flying over northern Ontario, is a stand of spruce or jack pine, very dense and surrounded -- in a mixed wood forest, and you can see with your own eyes that was likely a fire originated stand of that species.

DR. THOMPSON: Yes.

MADAM CHAIR: Now, are you saying when you're looking at landscape management at a stand level that the natural boundaries of such a fire originated stand would be what you could see?

DR. THOMPSON: It would be what you could see, but it may not necessarily be the basis on which you would make your logging prescription.

The basis on which you would make your logging prescription would be at the ecosystem level; in other words, if this stand for instance is a mixed wood ecosystem, then you might treat it very differently than if it were a jack pine ecosystem which

might be right adjacent to it.

You might selectively harvest trees within the mixed wood system, whereas you would not selectively harvest trees within the jack pine system.

And there is a lot of that kind of thing that is going on now, it's just that I think we need to go a step beyond, and that by the step beyond, I mean, we need to refine the techniques by which we are harvesting to much more closely approximate natural disturbance.

MADAM CHAIR: All right.

MS. BLASTORAH: One follow-up question of clarification from that.

FURTHER CROSS-EXAMINATION BY MS. BLASTORAH:

Q. Dr. Thompson, in response to one of the questions from Mrs. Koven you indicated that you didn't think ecosystem patterns were being entirely ignored and you used the example of salvage operations, and you then referenced hemlock looper.

Am I correct that the example that you were giving there was in relation to Newfoundland, not Ontario?

A. Yes.

MS. BLASTORAH: Thank you.

MR. MARTEL: I think what my colleague

was driving at, we've seen sites -- I mean, if one started 1988 and went to today we've been here, and we went to look at the application of the moose guidelines, for example, where a lot more factors seem to be taken into consideration, where the biologist could explain why they cut 500 hectares in low lying areas as opposed, and we're talking about the area you were familiar with around Kap and so on where you get these wonderful lowlands and highlands which are two feet different, and then the lowlands what's there.

You might leave some snags and that, but how many moose are going to be there that might be on the highlands which are only two feet difference but away from a lot of the water. So that is being taken into consideration a lot more than, let's say, pre-1988 or even --

DR. THOMPSON: Yes, it is, but you can't assume that because we're managing for moose that we're looking after a lot of other things. That's my point here.

MR. MARTEL: That's the other concern. I mean, I've raised the concern over and over again here, if we cut right to the water's edge, especially in northern Ontario we have little - call them potholes, lakes less than 10 hectares - and we cut right to the

about or the biodiversity that is associated with these ecosystems is present on the landscape somewhere and that the system is functioning - and by functioning I mean all of the species that are associated with it are there, all the patterns and processes that occur within the system are functioning - then it doesn't matter that they're not at point A any more because they are at point B.

But point A will ultimately have all of the attributes again to provide habitat for those species at some point in the future, and trying to manage a particular tract of land for all species at all times, you can't do. You might do that --

MR. MARTEL: Is that why you move to the intensive forest -- in your last chart you had the pie chart--

DR. THOMPSON: Mm-hmm.

MR. MARTEL: --which showed a large area for multi-purpose use.

DR. THOMPSON: Yes.

MR. MARTEL: Then intensive use near the mills, and then some areas just left aside.

DR. THOMPSON: The reason I'm suggesting that we need to do that is because if we're going to move to integrated resource management, annual

shore to many of those, and I always wonder what happens to the other wildlife around those little -- and there has been much concern expressed about that. There might not be any fish in those little potholes and so the fish guidelines don't apply, but what happens to other wildlife around those small areas?

DR. THOMPSON: Well, but you have to view all of this in the proper temporal context; in other words, you may not actually have to think about what is going to be living there at that particular point in time in terms of what was there just previous to it because ultimately in a hundred years, if it's done properly, what was there will be there again.

And you can't view the forest as sort of a static, in sort of a static mindset, you have to think about in the broad context; in other words, if a fire went through that it would eliminate all of the habitat for caribou anyway. If you understand what I'm saying.

MR. MARTEL: Yes.

DR. THOMPSON: And so just because caribou don't live there it doesn't matter so long as caribou live over here. And that's sort of the gist of landscape management is that you look at this broad pattern and so long as the species that you're worried

allowable cut is going to decline, and if you're going to maintain the mills with a reduced annual allowable cut, then the only way to do that is to produce timber as fast as possible on some lands.

And so in the areas, the broad area of the province where we're going to meet our biodiversity goals and also sustainbly develop the forest, the amount of timber that's going to come out of there per unit of time will have to decline. That's the only way it can be done.

MR. MARTEL: Over the large sector.

DR. THOMPSON: Over the large sector.

MR. MARTEL: But you would still use that to complement--

DR. THOMPSON: Yes.

MR. MARTEL: --what you would get from your intensive forested area.

DR. THOMPSON: Yes.

MR MARTEL: Or intensive managed area?

DR. THOMPSON: Yes.

MS. BLASTORAH: Madam Chair, I just have one or two questions, again arising out of that exchange with Mr. Martel. I will try to keep it short.

FURTHER CROSS-EXAMINATION BY MS. BLASTORAH:

Q. You gave some examples, or you

mentioned rather, Dr. Thompson, that you have some seen some examples of good forestry.

Was the kind of thing that you were referring to examples of areas left in cut-over areas, uncut areas left in cut-over areas?

A. Yes. That and as well much attention to site; in other words, not logging on a wet site in the middle of summertime, not doing intensive scarification but working towards a more natural regeneration of the site and so on.

Q. And would that work towards a more natural regeneration necessarily mean leaving the site to natural regeneration in all cases, assuming fire suppression continues?

A. Not necessarily.

Q. Okay. And one other --

MS. BLASTORAH: I think I'll leave it at that, Madam Chair.

MADAM CHAIR: All right, thank you very much, Ms. Blastorah.

MS. BLASTORAH: Thank you very much.

DR. THOMPSON: Thank you very much.

MADAM CHAIR: Thank you very much Dr. Thompson we very much appreciate you putting this effort into your submission and coming to Toronto

today.

DR. THOMPSON: Thank you.

MADAM CHAIR: Thank you very much, we will be returning at 1:30 this afternoon to hear the submissions of Dr. Welsh.

Mr. Pascoe?

MR. PASCOE: There was one document to be made an exhibit.

MADAM CHAIR: Thank you. Before we finish this morning, we received a copy of a letter dated May the 11th, 1992 to Mr. John Cutter of Meadowside Lumber from Ms. Mary Laronde, Stewardship Director of Teme-Augama Anishnabai with respect to comments made during the satellite hearing in North Bay.

And we have some copies of that correspondence for anyone who wishes to receive it, and we will give this Exhibit No. 2241, and it's a two-page letter.

---EXHIBIT NO. 2241: Two-page letter dated May 11, 1992 from Teme-Augama Anishnabai to John Cutter, Meadowside Lumber.

MADAM CHAIR: All right, thank you very much.

---Recess taken at 10:25 a.m.

---On resuming at 1:30 p.m.

MADAM CHAIR: Good afternoon. Please be seated.

Good afternoon, Dr. Welsh.

DR. WELSH: Good afternoon.

MADAM CHAIR: Dr. Welsh, before we begin, I always ask the witnesses - and I don't know why I do this - but I always ask them if they want their evidence affirmed or sworn in?

DR. WELSH: Yes, affirmed, please.

DAN WELSH, Affirmed.

MADAM CHAIR: Thank you, sir.

We also give the written material you submitted to us in advance of your presentation an exhibit number and this will become Exhibit 2342, and your presentation is about 20 pages in length.

We will give your written statement Exhibit No. 2342A and your interrogatory responses will be Exhibit 2342B.

MS. BLASTORAH: Madam Chair, I believe it's 2242. We're just having a little problem, we seem to have lost a hundred exhibits.

MR. MARTEL: Oh. It's 2242.

MADAM CHAIR: 2342.

MS. BLASTORAH: 2242.

MR. MARTEL: 43B.

MS. BLASTORAH: Oh.

MADAM CHAIR: I think it's 2241.

MR. MARTEL: We made the letter this morning --

MS. BLASTORAH: I think we marked the letter this morning.

MADAM CHAIR: That's right. Okay. We're very excited because you are our second to the last witness, Dr. Welsh.

Exhibit 2242A will be your 20-page written submission, and Exhibit 2242B will be your interrogatory responses dated May 13th 1992.

---EXHIBIT NO. 2242A: 20-page witness statement of Dr. Dan Welsh.

---EXHIBIT NO. 2242B: Interrogatory responses dated May 13, 1992.

MADAM CHAIR: And do you have any other written material you wish to give the Board?

DR. WELSH: No, I do not.

MADAM CHAIR: All right. Then why don't we get started.

DR. WELSH: I thought it might be helpful if I gave you a bit of background of my relative experience.

I am a graduate level biologist having

done a Masters degree in ornathology and a Ph.D. at Dalhousie University working on mammals. I've been studying forestry wildlife interaction in Ontario since 1975 based in Sault Ste. Marie for number of a years and subsequently for the last decade or slightly more out of Ottawa.

I've worked on moose in relation to forestry practices and forest habitats and, most recently, for most of that 15-year period, I've been working on forest song bird communities.

What I would like to do today is to present a rather brief overview of my perspectives on the primary considerations in managing Ontario boreal Forests for long-term sustainability and conservation based on that experience, and then to go over the recommendations and suggestions that I've made in my witness statement and clarify any points that people may wish to ask me at that time.

In my witness statement I reviewed developments over the last few decades of the conservation ethic at a world-wide level and I think particularly of importance there, stemming largely from the World Conservation Strategy in 1980, is the inseparable linking of conservation and development. I believe very strongly that they are inseparable

processes and that it's impossible to talk of conservation without development, even present role of man's position in the world today.

The only other point I would like to make by way of broad global overview is to point out that I think the rest of the world is going through much of the same steps in conservation processes as we are.

1991 marked the release of the second part, as it were, of the World Conservation Strategy entitled: Caring for the World, A Strategy for Sustainable Living. I think Ontario is very much in the same position right now. I think we're trying to develop a strategy for sustainable living, trying to in fact understand how to do things better if we were all agreed on the concepts, but it's the how might we do it that's important. So I see the Timber Management Class EA as the same exercise for Ontario.

And the reason I mention that is because I found in my own mind at least that's helped me because I found that we aren't alone in this very, very difficult venture, a lot of other people are probably going through the same process.

I would like to talk about the dynamics of the boreal forest and to show a few slides and I'll just talk generally around my slides, if that's

agreeable.

There are eight forest regions in Canada, eight large primary forest regions in Canada, and I think it's extremely important that we always remember that the natural disturbance regimes which generate those forests and which in fact maintain their unique characteristics are rather different.

The boreal forest, which is the forest that I want to talk about today - because it's the one I know best - is characterized by catastrophic disturbances, by a very high rate of turnover. It's a forest that changes a lot, the tree species tend not to be terribly long lived, most of them live in the neighbourhood of a hundred years or so, and so it is important to distinguish that forest from, let's say, a west coast temperate rain forest on Vancouver Island which might be much, much more long lived and would not normally be subject to nearly the same quick rate of disturbance.

I would like to talk initially about forest fires, and I know that several other witnesses have already spoken about fire, I thought it would probably be helpful if I were to give you some examples of one bit of landscape in the Manitouwadge area where we've done quite a bit of work during the early 1980s.

And in this first slide, which essentially is a map as it were of the forest region surrounding Manitouwadge, Manitouwadge is actually just off on the right and at the bottom, we're looking at an area approximately hundred square kilometres or a hundred kilometres across and 75 kilometres high.

The important point that I want to make in this slide which depicts the age of the stands resulting from forest fire is that the patches are relatively large. You can see that the purple and light blue and green patches are rather large patches. You notice the scale on the bottom of 10 kilometres, you can see that many of those patches in fact are 10 or 20 kilometres long, the purple one in the middle probably 70 kilometres by the other axis.

And it's also important to note that if we look at the dark blue, the oldest category, there isn't really very much dark blue there, in fact there's only about 3 per cent of that particular landscape is older than 200 years. Just underscoring my first point that the boreal forest in fact does have a lot of short lived piece and it does turn over quite often in, as I said, catastrophic disturbances in very large chunks.

The next slide is exactly the same piece of real estate but instead of looking at the fire

patches I've superimposed cutting history by the timber companies operating there from 1940 to 1980, and you can imagine -- at the same scale you can see that the patches are much smaller, and I don't wish to make a great deal more of that except to show you in the third slide, if I superimpose those two, then you can still see the big purples and light blue and the green from the first one with the patch sizes superimposed on them from cutting.

And the point that I wish to make is the obvious one, is that the patch size resulting in the way we cut the forest is in fact quite small in contrast to what determined the nature of most of that landscape; in other words, although we have a lot of forest fires on average big forest fires are much larger than cutting patches.

So to follow on from that point, we all know that the forest is composed of different tree stands of different species, but I think it's always important when we're trying to imagine what we should do with the forests to remind ourselves of that fact.

So we can see that there are of course aspen forests and mixed conifer and deciduous forests and purely coniferous forests. And those different forest types, if we looked at a satellite view - and

again in this case a slightly larger area, but again centered on Manitouwadge which is that blue spot in the bottom right - the only point I want to make with this slide is that that landscape is quite clearly a mosaic, it's composed of lots of different colours, as it were.

You could perhaps most easily think of it, at least I do, as a quilt, and those bits and pieces are the different forest stands of different ages, different forest stands because they are composed of different tree species, the tree species on the site resulting from the past history of the area and from the type of soil that's there, whether it's sandy or rocky, whether it's well drained or poorly drained, whether it's organic or bedrock and so on.

Now, that same type of information is contained in our forest resource inventory for the province, and this is just an example to show you at a relatively small scale, in case this is 4 square kilometres, that in fact we can, and regularly do, recognize all of the distinctly different forest stands based on their tree composition. Some stands are jack pine, some are aspen, some are spruce and so on. And those are a regular part of the tools that we use to manage the forest.

Now, I would like to talk for a few

moments about the forest ecosystem classification for northwestern Ontario, and although I suspect you've been introduced to it before, it's perhaps worth giving you some of my perspectives on what it actually might mean.

If we imagine all of those forest types in that mosaic we saw from the satellite, then trying to put any order into that is exceedingly difficult if we don't have some means of classifying or ordering them, and we're all of course most familiar with classification when it comes to perhaps sorting out species, so we know that birds have names or mammals have names, these ones are the same as each other, so they're the same species, but they're different than something else.

Well, I see landscape classification as essentially being a very similar procedure, trying to put some sort of order and means of identifying all of those forest stands in some way, and this diagram which is taken from the classification system is actually just a relatively simple picture of the relationship of 38 different forest stands.

And the people that developed this classification looked at thousands of different forest stands and after analysing all of those data said:

Well, there are 38 basic types and they portray them in this type of two dimensional diagram showing their similarities.

So we see that the ones on the bottom left, 35, 36, 37, and 38 are quite closely related to each other, they're quite similar and they're rather different from the ones on the top right, No. 3 and 12.

We can see that some of them are in fact quite close to each other, indicating that they're very similar, and the farther they are apart across the slide the more different they are.

On this figure we have exactly the same ones except we've got the trees superimposed on them, so we can see that little circle at the top that has 26 and 27 and 13 and 12, that's the pictorial way of representing the red pine and white pine stands.

Just to the left of that are a group of stands, forest types that would be dominated by jack pine. On the bottom is larch and cedar. We can see in fact from top to bottom that it goes from dry sites to wet sites. That is really what the forest ecosystem classification is all about, trying to in fact put some order into that landscape.

It's exceedingly important to be able to do that because for silvicultural purposes there was a

need to be able to identify sites based on what we could expect to happen there.

If they had deep organic sites, there might be concern about harvesting them in the summer, there could be regeneration considerations. The sites up at 30 tend to be rocky or very coarse gravel, so it's hard to plant there. The ones in the middle have lots and lots of balsam fir, and so we can expect competition. And so this really is a tool that was developed to help us manage the forest better.

So it struck us a number of years ago that rather than trying to independently develop descriptions of wildlife habitat that didn't fit with the systems we were using for forests, that we should try to bring the two things together.

One of the problems we've had in the past I think is that wildlife biologists tended to speak their own language and described forests in a way that the forest land manager didn't understand or didn't use, systems we were speaking were different. So we had the effect of speaking different languages. That was a real problem.

What we tried to do in this work that I will show you with forest song birds in the next few slides is to see whether we can bridge the gap, and the

reason for bringing these slides to show you is that I think they capture a lot of what we have to deal with when we think of how we must manage the forest, what is it that we need to be concerned about.

And in these next few slides what I'll show you, if you imagine this drawing, this graph as a backdrop, and I'll superimpose or paint on to that information about the abundance of a given bird. So that where they're very uncommon we'll put it in one colour, and where they're very common will be another colour and we can easily see that species in fact differ in their distribution and abundance and then I would like to draw some conclusions from that afterwards.

So, first of all, to deal with a white-throated sparrow, which I suspect many of you may know, and here you can see the -- I'll just point things out briefly. These areas here are 38 and 37, 36. So these are in fact, these stars or diamonds as they were show the position of those 38 forest stands that I showed earlier, and so that will locate you for the rest of the slides. And so you can see that in fact what I've done is just to superimpose some information about white-throated sparrows onto that forest ecosystem classification.

So you can see increasing abundance, the areas that are yellow are where white-throated sparrows are most common, where it's the darkest shade of brown they're relatively uncommon. And if we look at this slide I think the thing that we're probably immediately struck by is that white-throated sparrows occur rather broadly in all the types.

If we were to try imagine what we would do to conserve white-throated sparrows we probably would say: Well, perhaps we should keep everything, or if we keep some of it we will probably have something that's good enough anyway. So perhaps we shouldn't be too worried. Although it is clear that there's a little bit more brown in the middle than yellow, so those habitats would not be as good.

I would like to contrast this species with several others. The veery is a thrush much in the same family as our robin that we're all familiar with the and it's a common species in hardwood forests or hardwood dominated forests in the boreal. So we, in fact, can see that it occurs essentially on the righthand side. Anything on the left is not going to be of very much use to veeries and we can see that in fact the farther right we go the more veeries there are, and that group of stands is dominated by aspen and

birch, much like the slide that we looked at first of an aspen stand is the best habitat for them.

And I would like just you just to bear in mind that general picture that veeries occur there, contrast that with a closely related other thrush and obviously they have some sort of a pact because the hermit thrushes have taken on the lefthand side and aren't very common on the right.

So you can perhaps sense what I'm starting to lead to, that different species obviously have different habitat requirements, they occur in different forest ecosystems, and if we're thinking about how to conserve those species, then we have to be thinking of the value of those different forest ecosystem types.

And I would like to say at this point that I'm using birds as an example of all kinds of wildlife. It could apply equally to many other species, both vertebrates and invertebrates. I think the principles would be the same, although the exact details would change somewhat.

Now, if we were to look at a couple of other species, to complete my story, in case of the scarlet taninger, they obviously have very, very highly specialized requirements and only occur in a very small

number of stands.

Equally if we were to look at a small neotropical migrant warbler the Connecticut warbler, it takes the opposite extreme and only occurs again in a small number of stands but at the opposite end of the spectrum, down in the organic spruce dominated sites being most common in things that would approach spruce bogs.

Now, if we are going to be able to deal effectively with those birds in some sort of an overall plan, then what I would suggest is that in fact dealing with each one of those species - and of course just in the case of forest song birds there are 170 birds in northern Ontario, bird species, about half of those occur regularly in the forest - one can easily imagine trying to establish guidelines and procedures for dealing with each and every one of these and, of course, we would then have to deal with all sorts of other species if we were serious about conservation and, my mind at least, that becomes quite intractable.

I have difficulty imagining what we would do with it and once I started applying Connecticut warbler guidelines, I wouldn't know what to do with salamander guidelines and moose guidelines and so on. So what I would suggest is that in fact we have to back

off a step or two and think in terms of the ecosystems or the habitats that the animals live in and that we should be thinking about protecting and dealing with the landscape and planning for its long-term well-being on that basis and not on the basis of individual species.

And I think that you probably can see from the examples that I've given you of the bird relationship to different forest types that it's not enough to keep one or two types but, in fact, may well be that all 38 of those types have unique groups of species of wildlife and characteristics that are associated with them. We quite clearly are not going to keep Connecticut warblers unless we keep those areas, those type of forests in the bottom left and so on.

While it's, you know, sort of a first principle type of thing, I think this example perhaps helps bring home to us the importance of keeping that range of all the different types that are out there. And if you wish, you can think about those dots on there as being different parts of the mosaic that we looked at from the air photo.

Now, to finish up my wildlife part of things, I'd like to come back to Manitouwadge, an area

that I worked in in 1979 to '83, looking at success, at how forests change. Now, the forest ecosystem classification - I should have emphasized - deals only with mature forests, the forest that actually has trees on it. We obviously have all of the stages that forests goes through from the time it's first disturbed by fire, cutting through to it's actually a true forest, all of those stages we call succession, and those also have an important role in determining what lives on the landscape.

I would like to perhaps begin that by showing you two slides. This quite obviously is a cut-over. This is a very similar forest type that is also a cut-over, it's just somewhat older, and so when we're thinking about the forest, we quite clearly have to think about that sequence of ages, five years old, 10 years old, 20 years old, 40 years old because, as I will show you when we deal with the organisms, the fauna and flora that are associated with it, they change or turn over along with it.

I will just present one slide to demonstrate this, and in this slide we're looking again at birds, so perhaps I can focus that slightly. Looks like a terribly intimidating figure but, in fact, it's not at all, there are just a number of graphs put

together so that you have the opportunity to compare them.

And the way they are set up, the bottom line is ages, so on the extreme lefthand side there where you can see the zero in each one, those are the youngest ages of forest stands. Perhaps it would be best if I point some of this information out to you.

It's actually quite simple. In this side of figures we have the youngest stands of age zero, and this side, these stands over here are about 200 years of age. And so all of them have exactly the same axis, and these are just relative numbers. This is a bird called the alder flycatcher, chestnut-sided warbler. The names are not terribly important, what is important is these ones that I call early succession, in fact you can see, are quite concentrated on the lefthand side. By the time the forest is 30 or 40 years of age they've started to drop out, they disappear.

There's another group of species that I have called mid-successional species, they in fact occur mostly in the middle as it were, and so they're waiting until there is, in fact, a young forest. We deal with species that are associated in late succession, in fact we see that they're predominantly associated with the righthand side. And another group

of species on the bottom, just for interest, that in fact really don't seem to care very much about the age of the forest stand.

The only point I wish to make here is the same one that I'm making with the discussion of ecosystems; and, that is, that the components of biodiversity, the items of concern, when we imagine how we might deal with the forest, quite clearly pay attention to the type of stand that is there, is it aspen, is it spruce, is it birch, and they also pay attention to how old it is. Not all of them, obviously some of those on the bottom don't care how old it is, but clearly the ones on the top do. If we wanted to take it the top left the alder alder flycatcher, old forest is not going to do it very much good because it doesn't live there. So this is really sits as background to my recommendations that I make for things to be considered.

And I thought I would end with a quote that I find is increasingly being used, wildlife biologists traditionally quote Aldo Leopold. I think it's one that's worth bearing in mind.

Perhaps it would be easiest if I could just at this time go right into what I call recommendations. In my witness statement I in fact

made six suggestions about things that I thought needed to be considered when we imagine how we might make recommendations for managing the forests of Ontario, and I'll couch each of those in a little bit of the thoughts and logic extinction surrounding it.

And so first, if I could have the lights on as well I guess, I have no further slides.

MADAM CHAIR: How many did you have, Dr. Welsh, did you have 22 slides?

DR. WELSH: I can easily check. Yes.

MADAM CHAIR: Thank you.

DR. WELSH: If I could give you some of my thoughts on the way we should proceed. First of all, to discuss what I call ecosystem supply, which is a term that could easily be changed in some way, it could be forest stand supply or whatever is convenient.

What I'm talking about is in fact distinct functional units as described within the forest ecosystem classifications, aspen stands verus birch stands, young stands verus old stands perhaps.

Now, a fundamental part of, I think, all of our present thinking about sustainable development and biodiversity conservation is that we have to make wise use of renewable resources for today's needs while ensuring that all of those resources are conserved in

Ontario for future generations.

I think while that's a noble goal, I think it makes a lot of us just a little bit uneasy wondering whether, in fact, we can in fact stand up to the test to in fact use it wisely and yet make sure that the cup is always full, as it were.

I would argue that if we are ever going to be able to do that, the only way we're going to do it is if we maintain functional ecosystems. If we can't in fact keep the components of the landscape healthy and in tact and functioning, if we disrupt them and degrade them and change them, then it's never going to work.

We may have difficulty even if we do try to keep the ecosystem types but I am completely convinced that if we don't try to keep all of the systems that maintain all of the plants and animals and maintain them in a way that's going to continue to function in a system in something like the one they've evolved in, then we really are doomed to failure.

I use the 38 ecosystem types in that northwestern classification as an example of types of forest ecosystems. The relationship between forest birds and ecosystems demonstrates, I think clearly, that different species depend on different forest

ecosystem types.

If we added more bird species, then we could quite clearly have a more compelling case and I could have bored you with 20 or 30 slides showing they use all kinds of different parts. If we added other wildlife to it, then I think I could make an even more compelling case.

Now, I think that rather than try to specify individual requirements of all species I believe that a policy should be established to maintain a continuing supply of all forest ecosystem types in perpetuity. I call it ecosystem supply management, should provide the basic landscape template for all of our other activitues as their conservation is a fundamental biological basis for sustainability.

I believe that that has to be our first order approach to anything that we do and that everything else that happens, forestry practices, wildlife conservation for specific species, all have to be superimposed onto that, that basic system in which we say first and foremost we're going to keep all the pieces and try to maintain them.

The second point of ecosystem supply that I wanted to address is the question of the age of the forest, and you'll remember in the data that I showed

you from Manitouwadge dealing with successional stages that, in fact, different bird species depend on forest stands of different age.

And when we consider forest birds, it's interesting to note that about half of the forest birds in fact live in stands that are less than 50 years of age. If we're thinking about conserving them with all their important role in the control of insect pests and other such things, we have to be able to have young forest stands available to them, otherwise half of them are not going to have a home. I think perhaps it's about as simple as that.

Now, unfortunately, the pattern of forest succession in boreal forests is, I think at least, poorly known and we have little date to relate wildlife to succession at this point.

I suggest that there are two important steps to deal with that challenge. The first is to recognize the importance of successional stages leading to each of the mature forest ecosystem types, and we can do that by including temporal stages in any ecosystem conservation policies that are developed. So when we talk about what we might to do to conserve ecosystems, we have to think about all the stages that lead to their existence.

I think as well we should require the inclusion of successional stages in all forest ecosystem classifications, or if we don't require the inclusion, we should at least set about creating information on the successional stages.

Our ultimate goal should be to recognize the full range of developing and mature ecosystems in the landscape in an integrated system for all of Ontario, and that Ontario ecosystem classification should be hierarchic, it should have different layers of scale that it can deal with so that it can relate to national systems. I think this is quite important to manage a system which can effectively classify and deal with all the forest types and their successional stages.

I would like to talk a little about landscape pattern. The natural landscape I think provides a basic very conservative pattern for the temporal and spacial arrangement of landscapes. While it's easy to imagine that we could make some other ones, I think creating artificial and different man-made systems is ecologically dangerous.

All boreal plants, animals have evolved and are living in a system driven by the present biological processes and the present disturbance

regime. If we start changing that dramatically, then I think we run enormous risks based on the inadequate information that we have about the consequences of changes right now.

I think extreme caution must be exercised to avoid mistakes because they do take a long time to correct if we can repair them at all. And, as well, I'm particularly concerned with the wide-spread popular concern about forest landscapes that we also guard particularly against well intentioned mistakes resulting from inadequate understanding of boreal ecosystems, and I think that this will become obvious in some of my next recommendations.

The figures depicting fire and cutting in Manitouwadge clearly show that a relatively large-scale, coarse grain pattern resulting from natural fires and the size of cut blocks in any year are small in comparison. A range of many, perhaps most forest ecosystem types, exists within each of the large fire areas and all the ecosystems within one of those patches are the same age.

If you think back to my first slide and think of the purple or the lime green areas, each of those is of one age. For example, the light blue is 1830 when the area was very extensively burned. Within

that 1830 area you would find most, if not all, of the 38 forest ecosystem types, but they would all be of the same age.

That pattern of large disturbance areas containing many forest ecosystems or stands is a characteristic of the boreal forest. The individual stands there developed based on the characteristics of the site, as I said earlier, its soil and other aspects and the history, exactly how intense a fire was it, did it burn it right through to mineral soil, or was it just a quick passing one that left the duff in tact. So history obviously has some effect.

Now, I think that contemporary concern about clearcut size, in my mind, is largely misplace, as the problems I believe are much more likely to result from trying to simplify ecosystem patterns than from actually making large cut-overs.

I think it's far more dangerous to think about altering and changing all of the stands in an area to be dominated by black spruce or dominated by jack pine than it is to worry about the age at any particular point in time.

I think particularly it's important not to have what I call a cookbook approach to managing cutting. Small minimum clearcut size will result from

artificial regulations -- or result in a system that has little resemblance to natural systems, and I think most seriously it would result in putting together in an unplanned experiment the plants and animals from a whole range of stages that are normally separate.

That is perhaps worth elaborating on a little bit. But if we imagine one of those lime green patches that was fairly large, several thousand square kilometres or hectares, perhaps up to a hundred, 500 square kilometres.

In the extreme case, all of them are the same age and all of the plants and animals have evolved in that competitive balance and when we start putting stands of different ages together, especially if they're relatively small, then in fact they're interacting in a way that they have not normally interacted, and I think that that should be viewed as a rather extreme experiment.

Consequences of such competition in the new artificial landscape I think could be disastrous for many species, particularly those that require large even-aged forest stands.

Now, to avoid such problems clearcuts should be made in a range of sizes to emulate natural disturbance patches. I mention although really large

ones wouldn't be necessarily there for practical reasons. Within clearcut disturbance patches forest ecosystems should be regenerated in a size and pattern emulating natural systems.

There's no single optimum size for clearcuts and it's important to remember that no future forest of uniform age can be bigger than the largest cut.

And as well, research is urgently needed to compare the function and productivity of natural versus artificial man-made forest ecosystems. In particular, attention needs to be addressed to the role of residual unburned stands, fire-free reserves; that is, the wood that's normally left behind, the stands that are left behind during a fire and to standing and fallen dead material, all of which are largely missing in cut-overs.

The reason I stress this is that if we, in fact, are going to have man take an increasingly active role as major disturbance means of maintaining the boreal forest, then we desperately need to know just how well we're doing that, are man-made forests really the same as natural forests. If they're in fact different, we may well be able to modify what we do and thereby change and manage much more effectively.

My last recommendation points out the fact that although the boreal <RAL> is largely catastrophic, not all forests come by -- into being as a result of catastrophic disturbance, and in order to maintain a continuing supply of forest ecosystems types we will have to develop specific silvicultural methods to allow the perpetuation of all forest ecosystems.

I believe that ecosystems that cannot be regenerated should not normally be cut. Reasonably straightforward. I think we're going to change it and do away with it, then perhaps we shouldn't cut it at all.

Such silvicultural tools that we would use as special methods would include changing our cutting intensity, perhaps maybe single tree removal, light selection; in other words, looking at some alternatives to intensive clearcuts. And I think that as a final part of that recommendation that we have to give serious consideration to stratifying the land base into zones for intensive and extensive management.

That's an overview of my witness statement.

MADAM CHAIR: Thank you very much, Dr. Welsh.

Will be there any questions for Dr.

Welsh?

MR. LINDGREN: Yes, Madam Chair.

MADAM CHAIR: Mr. Lindgren?

MR. LINDGREN: A few brief questions.

CROSS-EXAMINATION BY MR. LINDGREN:

Q. Mr. Welsh, my name is Richard Lindgren, I'm appearing as counsel for Forests for Tomorrow.

I have listened to your evidence carefully, we believe it to be totally consistent with our approach, but I want to ask you a few questions to make sure that is the case.

First of all, can I ask you this: For the purposes of maintaining biodiversity, I believe that you have advocated that there should be a range of cut sizes and age-classes within the boreal forest; is that correct?

A. Yes, that's correct.

Q. And I take it that you haven't had an opportunity to read Forests for Tomorrow terms and conditions?

A. Not in sufficient detail to comment on them.

Q. And I'm not intending to ask you to endorse or to comment upon any particular provision,

but I would like to suggest to you that the intent of the FFT terms and conditions are to provide for a mix of small cuts and large cuts and a mix of age-classes and so forth.

And, in particular, on the issue of large cuts, there is provision that would enable a forester to undertake large clearcuts if there was an ecological or biological need for it.

So that if a particular wildlife species needed a large area of similar age-class, that can be done under the FFT terms and conditions.

And the overall intent is to take the landscape approach and to simulate or be guided by natural processes and natural dynamics.

And again without asking you to endorse any particular provision, does that sound like a reasonable approach to you?

A. I think in my mind the important thing to think about when we think about large area disturbance patches is to be sure that we don't divorce that large area concern from recognizing that in the natural situation that large disturbance patch would be regenerated by a large number of different forest ecosystem types.

I'm not in any way suggesting or

sanctifying large scale clearcuts, we try to in fact then dramatically force into a new template to grow just one type of tree and, in fact, in the natural circumstance large disturbance patches, because of the site characteristics, because of history would come back into a range of different forest ecosystems, those 38 ecosystem types might well all grow in one forest burn area one very large one.

And so the diversity within the landscape in the boreal is traditionally maintained by differences between sites not by age as much.

The age patches tend to be very large. If we imagine, as I suggested earlier, a quilt, you can imagine large patches with smaller patches within them. The smaller patches are the forest site types.

So I think it's extremely important when we think about this concept to make sure that we do link those two thoughts.

Initially it's a little bit counterintuitive to say: Well, we need bigger cuts, but what I'm really suggesting - and apparently you have suggested the same thing - is that there's nothing per se wrong with large area being disturbed at the same time, as long as we maintain the natural diversity within the forest of all those site types, and it is

important when we think about disturbances to think about the age of the disturbances.

I think I cautioned a little bit about the problems of changing competition patterns. I think a real problem we have in the boreal quite often is successively building cut upon cut in some sort of a sequential way, cutting five or 10,000 hectares and then adding another piece to it the next year and another piece to it the next year, so that we are continually chewing away at it and I personally think that that's likely to give us problems and it is a very unnatural one. So the general guidance I'm suggesting is that we should use the natural landscape as a model to some extent.

Q. So if I understand your answer then, you would have no objection to a provision in this Board's order that would allow large clearcuts to be undertaken if there is a biological or ecological need for it, or a particular wildlife species needs a large area of similar age-class?

A. More strongly than that, I think that given what we now know about the boreal it's essential that we recognize the need for large forest stands.

If you imagine jack pine - and many people suggested small clearcut sizes in the order of

40, 50 hectares, you see other jurisdictions that are down to 10 and 20 hectares - many species that associate with the boreal jack pine in fact have relatively large territories, I'm speaking just of birds now, so that in 20 or 30-hectare stands they couldn't even begin to set up a few territories, they're probably quite likely to be unable to exist, at least to reproduce correctly and have sustainable population.

Jack pine regularly occurs over very large extents following fire. So it seems to me that if we're going to try to manage the integrity of the boreal, then we have to allow that type of disturbance to take place.

MADAM CHAIR: Excuse me, Mr. Lindgren, could you remind the Board what clearcut limit size your client was asking for jack pine?

MR. LINDGREN: Funny you should ask. In condition No. 29 we have indicated that clearcutting can occur up to a hundred hectares depending on site, but we built in an exception for biological purposes and you'll find that in Section 32; namely, you can exceed that guideline - and we're calling them guidelines, Madam Chair - if an ecologist determines that a larger area is needed or necessary for a

particular wildlife species.

DR. WELSH: You see, I realize that what you're suggesting is mostly quite compatible with my perspective, except that it would seem to me that if we take an approach that we have to look for wildlife species that give us exceptions to do something different than the rule, then the rule should try to keep the system as natural as it is -- as natural as it can be.

So my own approach for any given management area would, in fact, be to try to look at the normal fire disturbance and to look at the normal stands size and competition and try to emulate that. That's going to be very different in Kenora than it is in Temagami.

So there will have to be a different set of approaches because those forest regions are quite different from each other. I don't see it as being something that you will ever know absolutely and precisely.

We will know the general bounds within an area. We might well have in mind, you know, 10 or 20 or perhaps even, you know, a different of guidelines for each FMA that say: Well, this is what this area looks like and it generally tended to have fires this

size and this is its age distribution and this is the stand type.

If we look at jack pine in Kenora, say, or Ignace and places like that, the jack pine stands are huge. We look at them in Chapleau, they're relatively small.

So rather than push for a single guideline that would deal with all of those things, I tend to prefer the approach which says that we look to the system within the area to provide our guidance, and I recognize that seems initially to be a little bit more complex, but I don't think it need to be.

MR. LINDGREN: And I'm not sure that's inconsistent with our view either, Madam Chair, quite frankly, because we have put in quite detailed provisions on the need to implement the landscape approach.

Q. And, Dr. Welsh, I'm not going to take you to that provision, but it's there and it's been referred to and there you will find very clearly a statement that FFT wants the MNR to maintain and perpetuate in perpetuity all ecosystems and ecosystems types.

Now, just a few final questions, Dr. Welsh. And on the issue of large clearcuts, can we

agree that large clearcuts should normally only be undertaken where regeneration is going to bring back a proper or satisfactory mix of vegetation and so forth. Can we agree on that?

A. Sure. It seems to me to be beyond contention.

MADAM CHAIR: Excuse me. Does that also apply in your recommendation 6 where you suggest stratification into intensive management zones as well?

DR. WELSH: Well, I think what Mr. Lindgren said is: Do I agree that we shouldn't in fact cut down the forest if we can't regenerate it, and whether --

MADAM CHAIR: If you can't regenerate it to the stands that exist, but in intensive forestry would you see stand conversion as being a possibility?

DR. WELSH: I think it would have to be and that was, in fact, why I suggested we would have to recommend that.

I think that we cannot afford, either economically or ecologically, to try to manage at a moderately intensive rate over all the landscape. We all are aware of the fact that the resources are not particularly well positioned relative to our distribution of people and so it seems to me to make a

lot of sense to put our maximum efforts into production forests on some areas where they're going to be most convenient and economically useable and I see nothing wrong with changing the type of stand there, we're essentially farming trees in that case for our own use and I didn't intend to imply that those should be of the same sort that grew there.

My vision would have probably relatively small areas that were intensively managed, putting a lot of effort into maximizing production of specialized products that we thought would do us a lot of good, and over much of the landscape we would then practise much less human intervention involvement.

And those are the ones I'm speaking of when I say that they should be regenerated along the guidelines of natural ecosystems. Is that clear?

MR. LINDGREN: Thank you, Madam Chair. I would point out that's Mr. Merek's view as well.

Q. Now, Dr. Welsh, you did make the statement that the ecosystem types that cannot be regenerated should normally not be cut.

And so I take it by that you're meaning that silviculture considerations should play an important role in determining where you cut, how you cut, the shape of the cut and so forth?

A. Largely I suppose ecological logic brought forward, but the emphasis that I wanted to make was that although that I had mentioned throughout that catastrophic disturbance was a part of most of the stands, that some of the stands in fact have not developed as a result of disturbances that killed all of the trees, in fact, we do have uneven-aged stands in the forest.

Some of our white pine, pure white pine and white pine mixed woods, for example, have an uneven-aged structure; when a fire goes through those areas not all of the trees are killed, and it would, of course, be quite inappropriate to suggest catastrophic disturbance.

In that case we might in fact need to go in and rather gently manipulate them, take some trees out, try to mimic fire in some way and have regeneration in order to perpetuate them.

Uneven-aged upland black spruce is another example where we have, in fact, still some remaining very old black spruce stands that are uneven in age and if we want to keep them those around, then we're going to have to do something other than clearcut them.

So what I'm suggesting is consistent with

the goal of sustaining the ecosystem types. I was just pointing out that while we may well be able to do rather catastrophic types of disturbance for much of the boreal, there are going to be forest stand types that we're going to have to care for, and until we know how to do that, we probably shouldn't go around cutting them down because we could easily lose them.

Q. Just so I understand it correctly, if a forester has silvicultural concerns about his or her ability to regenerate a particular ecosystem after clearcutting or large area clearcutting, then the forester normally should look at other cutting practices or maybe even other sites. Is that what you're saying?

A. Yeah, that seems to me to make only, you know, very basic common sense, if we're interested in biodiversity conservation. How can we eliminate a whole forest cover type from township after township, not be able to replace it and say we're being environmentally responsible. And that just seems to be counterintuitive to me, so...

Q. And finally, on the issue of biological diversity, you've indicated that you've had some experience with moose and I take it that you're are familiar with the moose habitat guidelines?

A. Yes, I am.

Q. Can I ask you this: Will simply using the moose habitat guidelines and using moose as a featured species be enough, in and itself, to ensure the maintenance and protection of biological diversity?

A. In one word, no.

Q. And why not?

A. I will pick up on the word that you said, ensure. The moose is an early seral species, lives in young forest by and large, it has some requirements for older forest for cover later in the winter, but the guidelines as they're presently written don't clearly enough specify the types of forest stands that need to be maintained in order to conserve moose habitat.

So there are a range of possibilities that the land manager can have in applying moose guidelines. So you might well get most of what you wanted, but you might get nothing of what you wanted relative to my guidelines. You might protect two or three ecosystem types or you might protect 20 or 30 of them. There's, within the moose habitat guidelines, no specific prescription that relates to ecosystem conservation.

So, by chance, you might do quite well

but also, in other circumstances, you could do rather poorly relative to the broader goal, and it's that element of uncertainty that makes me uneasy about using that type of guideline. It's far too unsure a process. Biodiversity conservation would, at least in my mind, be a byproduct of moose management and as a byproduct it's somewhat uncertain.

Q. And is that why you have advocated that biological diversity should operate as -- you described it as a first order goal or objective?

A. That's correct. I believe very strongly that when we kind of back off a little bit and look at what our challenge is, this idea of trying to sustain that forest in perpetuity we really jave to think about what is it that we have to do first, and it seems to me that with the exception of areas that you might want to farm intensively in one way or another, what we have to do over most of that is try to keep the ecosystems functioning, keep the basic land process going on to sustain all the plants and animals that are there.

That is wise use of the land. And the way to do that, in my mind, is to set about doing that first, and then to see how we can fit other things into our plan afterwards.

So I wouldn't set about deciding what trees I wanted to cut down and then add conservation afterwards, nor would I set about trying to figure out how to farm moose best and then add other things afterwards. I would rather say: Well, overall I want to make sure that I keep a supply of all the ecosystem types and use that as my first basic principles and then add all of the other things on to it afterwards.

So that's what I call a first order activity. It becomes not a specific thing that you do but rather a basic process and you're ongoing process is conservation.

MR. LINDGREN: Well, thank you, Dr. Welsh. Thank you, Madam Chair. Those are my questions.

MADAM CHAIR: Thank you, Mr. Lindgren. Any other questions for Dr. Welsh?

Mr. O'Leary?

MR. O'LEARY: No, Madam Chair.

MADAM CHAIR: Ms. Blastorah?

MS. BLASTORAH: I have a few questions, Dr. Welsh.

CROSS-EXAMINATION BY MS. BLASTORAH:

Q. You indicated in response to a question from Mr. Lindgren that you had no objection to

a provision allowing for large cuts, but if I understood you correctly your response was that you saw it not as something that should be allowed as an exception.

In other words, if a rule is in place that restricts your ability to produce large patches on a landscape where appropriate, those situations where you can rationalize them based on the requirements of individual species, that you would see that as perhaps not the most appropriate approach to take to producing appropriate patterns on the landscape. Did I understand you correctly?

A. Yes. It becomes a little bit difficult but perhaps if we were to think of a guideline of, let's say, a hundred hectares, and we were to imagine forest stands in the Dryden area, a large portion of those individual stands in that area might well normally be much larger than that guideline would suggest, so most of the forest stands that you would want to regenerate would be would be what I suggest would, in fact, be exceeding the guideline, and what I'm suggesting, rather than having a specific size guideline, is that we use the normal disturbance regime within the landscape to, in fact, provide some guidance.

And the two things that are in the landscape that are going to give us some guidance are the need and range and size of stands, be it black spruce or balsam fir, mixed wood or whatever, and they will certainly be different for different stand types and the age of the disturbance pattern. So the size of and age of disturbance.

So that, you know, if fires in an area normally have a distribution which regularly had fires of a thousand or 2,000 hectares, then it seems to me to be artificial to say it should never be larger than a hundred hectares.

And the main concern that I have there is that once you say a 50-hectare cut, then a stand that you regenerate there can never be any larger than that. And so if you're trying to deal with wildlife species, for example, that might have home range requirements of several hundred or even thousands of hectares, they obviously are not going to find a large enough home there.

And so that's the problem. So I think it's preferable to approach it from the other direction.

Q. So would you agree that rules which have the effect of inhibiting your ability to manage

consistent with historical landscape patterns are, in fact, not helpful and could be dangerous?

A. You said they would not be helpful and could be dangerous? Yeah, from a point of view of ecosystem sustainability to the extent that they can constrain your ability to sustain ecosystems, then they obviously would not be helpful.

Q. And I'm thinking, when I asked that question, about your comments in your witness statement where you say extreme caution must be exercised to avoid essentially well intentioned efforts?

A. Sure. I think perhaps this is worth elaborating on a little bit, because certainly the clearcut size consideration is something we all think a great deal about right now, and I would like to -- we sort of try to imagine from a national perspective a lot of our present public knowledge about clearcut size I believe stems from popularized information about what's happening in west coast forests.

And there are a lot of west coast forests in which people have been trying to get smaller and smaller clearcut sizes. I would argue that in some of the temperate rain forests on the west coast that no clearcut size is appropriate because those forests probably shouldn't be clearcut, and we've seen a lot of

people lobbying very strongly to get clearcut size reduced because that's what has to be done there to, in fact, try to sustain those forest ecosystems.

And I would argue any clearcut size there is nonsense, because you really can't regenerate those forests in a natural way and have clearcuts.

Equally, you can't use uneven-aged forest harvesting in a jack pine forest in Ignace or a clearcut of 20 or 30 or 40 hectares and regenerate the landscape because that's not the way that landscape works.

And the only point I want to make is we have to understand the landscape. We have to do something different when we're working north of Sault Ste. Marie from what we do at Ignace, let alone we can't do the same thing on Vancouver Island that we do in Ontario, and I think that's the point.

And what we have to do is to try to help each other to understand what the differences are. I mean -- and I think white pine is another classic example where, you know, in many cases for some of our remaining white pine stands we may well need to disturb them somewhat in order to have some regeneration and yet cutting down any trees in those last remaining stands is not very intelligent to some peoples' mind

and we have to really try to understand that.

And those are tough processes I guess. They don't make them any less sensible ecologically.

MR. MARTEL: How long are we from being in a position, I asked your predecessor here, your colleague this morning to develop the knowledge needed to go out there and do the cutting in the way you described in the patterns and sizes you've described. Are we ready to do that now?

DR. WELSH: Yes, I think we could -- I think in most of the areas of the province that I'm familiar with we could start tomorrow, and I say that with the qualification that it would have to be done with the an open mind and we would have to be prepared to change our ways and learn, but we're ready to start now.

MR. MARTEL: But...

DR. WELSH: In other words, we'll always have to learn more, but we know enough now to do much, much better than we are doing.

MR. MARTEL: Yes, but we heard a lot of outcry about some of the cuts west of Thunder Bay which are large jack pine cuts, or south of Dryden or the area the size of PEI, and you read that one, and we heard it here, but those in many instances were massive

similar type forests well beyond a hundred hectares or 200 hectares or 300.

I mean, you can still go out there and see them as you fly, and you can see them for miles, but people would go absolutely bonkers if you said to them and we're going out there and we're going to cut 5,000 hectares.

DR. WELSH: I really --

MR. MARTEL: And using your idea, no constraint, just following the natural patterns and age. We would really have difficulty selling that concept, I think.

DR. WELSH: I think the emphasis of what I've been suggesting is to follow a natural age-class distribution and size distribution, and I contend that the areas that you're describing, in fact, the age distribution is not natural and, in fact, if we were to look at age-class distribution and size distribution it's, in fact, quite different from what we would find naturally, and so...

MR. MARTEL: Now.

DR. WELSH: Now.

MR. MARTEL: But previously.

DR. WELSH: As a result of what we have done to the landscape.

MR. MARTEL: All right.

DR. WELSH: It looks quite different than it would look if we followed the approach that I'm suggesting. And, in fact, what we find is, as you mentioned, is a continous linking of contiguous clearcuts and on top of that, in many cases, the removal of older bits within those stands in a way that's quite different than that landscape would have looked before harvesting.

So I don't think that is natural and I think --

MR. MARTEL: Let's go to the areas that aren't cut yet, just to be the devil's advocate. Let us go up to where Reed Paper used to own some of it and there's a lot there that still isn't touched.

I would venture to say that if you were in there to cut tomorrow and started there would be -- with massive cuts in those areas of the same size, there would be an uproar like you couldn't recall having occurred in the past with respect to cuts. I just -- that would happen, I'm convinced. Maybe I would be wrong.

DR. WELSH: Sure.

MR. MARTEL: It would be a pleasant surprise, but I don't think that would be the caes, And

I just don't know how you change all of the thinking that's been going on out there.

I mean, the witnesses that we heard at this hearing in each place argued that the cuts were too big, the owners, as we've heard from various groups saying the owners have a right to determine and the MNR has a mandate to manage on behalf of the owners, but some of the very people who might advocate landscape management on the other hand would be out there screaming as loudly as anybody else that the cut was too big. I don't know how you sell that idea.

DR. WELSH: Do you want me to respond to that?

MR. MARTEL: Yes. Help us.

DR. WELSH: I guess when we are unsure we should always be cautious and go slowly, but I would argue that a fundamental difference in what I'm suggesting is first and foremost that we have a plan, a first order plan for ecological sustainability.

That, in fact, what I'm suggesting is that we identify the characteristics of the landscape and its ecosystems first and foremost and that we plan for that in perpetuity, and that's a very distinct departure from the normal first order approach that has led us in the past which has been largely timber

supply.

So, first of all, I think the identification of the plan for ecological sustainability and continuing supply is important. If we could in fact demonstrate that the disturbance practices that we were using were resulting in forests that were very much like, or the same as ones that would occur naturally and that we were continuing to sustain all of those forest types; in other words, we said there were 38 forest types here initially, this was their age structure and this is their size, and look in my plan we are still just turning over the land in the same way, and first and foremost I'm planning for conservation, then I think that you would have the start of an argument that people might begin to understand and accept.

In the absence of that, you haven't got a hope in hell of selling it - excuse me - so I agree with you, but I do think it's a hard sell but I don't think it's an impossible sell.

MR. MARTEL: Let me go back to my initial question then, because you said we need the plan. The plan isn't in place, so could we start cutting tomorrow in the way you suggest? All the pieces have to fit in place and if you take one piece out of the jigsaw

puzzle you could be in trouble.

DR. WELSH: Yeah. Well, I guess the first thing we need is some sort of policy, you know, the big goal that we all believe that that's what we want to do, and I suspect that not everybody would necessarily agree with what I say is the most important thing to do, my concepts of sustainability might not.

But if we did in fact have a policy that said that we believed in biodiversity conservation and continuing supply of ecosystems, we could then set about putting plans in place on individual FMAs to work towards that, and that's the important part of what we would have to do.

If such a policy existed right now, then in a number of areas of the province that I'm familiar with there are foresters both within the Ministry and in industry that could set about starting to put a plan together.

The first couple of years might be imperfect. I think what we don't have right now is any policy which identifies these things as being the most important. We haven't set about, in fact, saying that in order to be environmentally responsible for the world we want to, in fact, have ecosystems in perpetuity of the type we describe, we haven't said

that we want to practise biodiversity conservation.

If we accepted that as a basic set of guiding principles, a basic code of conduct that said: Okay, the first order that's what we're going to do. What I'm saying is there are a lot of people out there who right away could start working towards it, and I would think that most of them probably wouldn't go for large, large cuts right away.

We're looking at a range, but what is important is that we would not be pushing for 50-hectare cuts everywhere when, in fact, that was inappropriate to meeting our ends.

And that was the point I really wanted to make, is that we can -- we're dammed on both ends. If we argue and regulate so that the cuts are too small we're going to run into trouble; and, obviously, if we just, you know, cut willy-nilly with no controls we're going to run into trouble.

So have a policy that says what it is we would like to have and then some specific plans and try to be little bit moderate.

I'm not arguing that we need 10,000-hectare cuts, I am arguing that 100 and 500 and 1000-hectare ones may well be necessary in a lot of cases. And I don't think it will be easy, but I do

think it's possible.

MS. BLASTORAH: Q. Dr. Welsh, just following up on that briefly. You did say in response to -- I believe it was in response to Mr. Martel, that you could go out and start doing this, begin to do something in this vein tomorrow, I think was your word.

Am I correct from the exchange that's just taken place that what you meant by that was that at the management unit level you could go out and begin to introduce the kind of thinking of patch size and so on into making determinations about cut distribution, cut size. Is that what you were thinking about?

A. Yes, that's right.

Q. And am I correct when you said that we would have to gain more knowledge and we would gain more knowledge over time, that that would be things like adding the successional stages to the FEC types and developing a hierarchical ecological land classification covering more than just mature forest types.

Was that the kind of thing you were thinking about?

A. Those are two very good examples. Obviously since the classification is presently incomplete and the stages leading to some of the mature

types aren't really as well known as they should be, we need to do more work on succession. And, equally, if we wanted to think about the scales, we would need to do more work on the hierarchy.

So there are a number of things which would have to be done to try to make our approach more perfect, but what I was suggesting was that we did know enough right now to start doing things differently, and I think to start doing them much better.

Q. And the kind of more sophisticated, if I can use that term, management for ecosystem types at the landscape level that one could do once a full-blown hierarchical ecological land classification system was in place would be different than what you could do going out tomorrow to start to think about this?

A. I think that forest land management is always going to be evolving and adapting as our knowledge expands, so it's not just waiting for a single thing to happen, it was more a general caution that we're going to have difficulty in inventing the perfect vehicle first try and, therefore, it would have to be adaptive.

You know, our first steps might in fact not be perfect and we would have to change them.

Certainly some of the things that we know would change would be the development of a better integrated classification across the province. But my caution about them changing was more just a fact that when you try anything new we can expect to have to be able to change, and it is important to recognize this in land management. It seems to me that it's an area that we have a lot of difficulty.

And if we're trying to manage our own vegetable garden or our own back 40, then we all readily accept that we may change our mind. We will try something and we'll see how it works and we can probably articulate our goals quite well and say what it is we want to get out of it, but when we think about public land it seems to me that sometimes we probably, rather unfairly, look for policies which are going to tell us before we've tried them that this is the policy that we're going to have forever.

And I was just generally thinking that, you know, the first policy that the very best managers and biologists and foresters in the province would come up with probably would need a little bit of changing as we went on. That was more of what I was thinking, but you're quite right, there are some specific things we would have to do.

Q. So that flexibility, that ability to change and adapt as more information is gained is important?

A. I think the basic principles which I see essentially as a code of conduct as people are not very flexible. I think we either bite the bullet and say, you know, we're signing on on basic principles about what we believe in, which I believe is the underlying tentative definition of biological conservation, that we're going to try to use things for the well-being for all of us but we're going to try to maintain them in perpetuity.

That I think we all have to buy into in principle. I don't think that should be very flexible. The details further down the line of how you do that, they're going to be flexible, they have to be flexible because somebody's going to invent something five years from now that's different; you know, we're going to find a better way of doing things.

MR. MARTEL: Well, we've been at it now four years and we've sent the parties to negotiate on two lengthy occasions and it sounds very nice but I have a book that shows the Illing negotiations which was the second set, and I outlined those things in red that we couldn't get agreement on and those that they

had agreement I left in white, and the book is literally Mao's little red handbook, it is just totally red because it's very difficult to get agreement on these things.

As I sit here, the perception I have after negotiations, after four years of evidence, we're still miles apart on everything almost and that's what's frustrating because there seems to be no ability to get agreement because there doesn't seem to be the flexibility there that people are prepared to move and adapt as we go along, starting from a whole new set of principles that have been put out.

And I just don't know how you reach that sort of agreement with that sort of ease that we've heard from you and your colleagues this morning.

DR. WELSH: Well, what I was trying to do is just give some ideas, some perspective of a wildlife ecologist about, you know, what we need to be thinking about in order to conserve wildlife and biodiversity. And having worked in the province for 15 years with a lot of colleagues and friends from forestry and wildlife I've, you know, sat around a few tables where we didn't reach unanimity right away.

MR. MARTEL: You saw that you were 2,000 - one more number we'll be able to play bingo,

there will be five numbers - 2243 or 4 you are, so we're doing well.

MADAM CHAIR: Are you finished?

MR. MARTEL: I'm finished.

MADAM CHAIR: Ms. Blastorah?

MS. BLASTORAH: I have a couple of more brief questions, Madam Chair. I will try to finish up quickly.

Q. Just following up on another area that was touched on by Mr. Lindgren, he asked you about the application of the moose habitat guidelines, and in you indicated -- I think you indicated you are familiar.

Am I correct that you do not feel that managing for individual species is necessarily inconsistent with managing for ecosystem conservation, but that the management for habitat for individual species should be done in a way that is consistent with the biodiversity objectives, if I can put it that way?

A. Yeah. I'm glad you brought that up. I wasn't -- intentionally in my witness statement I wasn't trying to present a manual of how you would do things, but rather arguing what I thought were the first order of the basics.

You couldn't or unlikely to sustain a

number of species by doing what alone. I think for some rare, threatenend or endangered species or things that have very specified requirements or indeed need large areas, you may well need to do what I call top down management, you may have to add some layers for some species because they have very specialized requirements, and because they're already rare or threatened in some way, we wouldn't want to take our chances with them and, you know, we might intervene rather specially to do that.

Moose doesn't fit into my concept of very threatened or endangered just yet, so it probably isn't one that I would necessarily apply top down management on, although if we identified a specific need to produce that for hunting purposes or anything else, and that was identified as being, you know, in the common good, there's no reason that you wouldn't do that, as long as it didn't conflict with the basic biological conservation or practice.

So there are lots of ways you could do things. I see no a priori reason that you couldn't meet my requirements for ecosystem conservation and add guidelines for grouse production or moose production or anything else on top of it, but that wouldn't be necessary to meet the goals that I've suggested.

It would be necessary to manage especially for things that are rare, threatentend or endangered, or else you couldn't have conservation.

So what I'm suggesting wouldn't solve all of our problems. Is that...

Q. Yes, thank you very much.

MS. BLASTORAH: My last question, Madam Chair, is really a question of clarification from Mr. Lindgren.

He put a number of propositions arising from Forests for Tomorrow's terms and conditions, and he put a number of characterizations of the Forests for Tomorrow terms and conditions to the witness and asked Dr. Welsh whether he felt that clearcut limitations or guidelines, as he characterized it, of the type proposed by Forests for Tomorrow were consistent with his view.

And when Dr. Welsh indicated that he felt that having exceptions where you could produce large clearcuts were perhaps not, if I understood him - and I attempted to clarify that - not the way to come about it, Mr. Lindgren indicated: Well, Forests for Tomorrow is also proposing landscape management terms and conditions.

And I'm just wondering if Mr. Lindgren

can clarify for me whether I am to take that to mean that Forests for Tomorrow's silvicultural prescriptions included in their latest terms and conditions are intended to be then subservient to or - if I can use that word - subservient to their provisions in relation to landscape management; and if, in fact, these terms and conditions turn out to be inconsistent with the landscape management views or the objectives, the latter would take precedence?

MR. LINDGREN: Far be it for me, Madam Chair, to offer evidence on the subject. I think it's a matter more properly reserved for final argument.

However, I will say that it was always our intent that the silvicultural provisions we have in our terms and conditions would be carried out in the context of overall landscape management to conserve biodiversity and wildlife species in perpetuity.

So I'm not sure it's even a question of subservience or conflict. One is a tool to carry out the other.

MS. BLASTORAH: And what I'm trying to clarify is what I saw as an apparent or potential inconsistency and if, in fact, it was determined that those limitations as we've heard today were problematic in terms of landscape management, am I correct that

Forests for Tomorrow would be willing to drop those terms and conditions?

MR. LINDGREN: Madam Chair, I think this is a somewhat ludicrous exercise at this stage of the game.

We fully stand behind our silvicultural guidelines and provisions in the terms and conditions, we stand behind our advocacy of a landscape approach. We don't think there's any inconsistency or conflict between the two.

I would, again, respectfully suggest this is a matter more properly left until final argument.

MS. BLASTORAH: Madam Chair, I was just attempting to clarify that. I will leave it at that.

MADAM CHAIR: Thank you, Ms. Blastorah.

Thank you, Dr. Welsh. Thank you very much for coming today.

DR. WELSH: Thank you.

MADAM CHAIR: The Board appreciates your presentation very much and thank you.

DR. WELSH: It's been a pleasure. Thank you.

MADAM CHAIR: It's three o'clock and we were to start our scoping --

MR. O'LEARY: Madam Chair?

MADAM CHAIR: Oh, Mr. O'Leary.

MR. O'LEARY: I just have couple of points I would like to raise, with your leave of course.

It is not our intention to participate in the scoping session this afternoon, I thought an explanation was in order, and also an explanation for the fact that we didn't participate in the prior scoping session in relation to the reply and that is - and you've heard this story before - it all boiled down to a question of money.

As of this point, this juncture in time the Coalition is unable to muster sufficient funds to participate in the reply portion of the hearing. Indeed there is a great risk that we will be unable to participate to any extent, if at all, in the argument portion of the hearing as well.

One of the Coalition's staffers has been let go, Mr. Hanna's involvement has been limited and curtailed and, unfortunately, my involvement is also a little bit restricted over the past few weeks.

I thought I should draw to your attention that it is unlikely that you will see much of a presence of the Coalition in Sudbury during the reply portion.

Madam Chair, the only other point I would like to raise at this point flows out of the cross-examination of Mr. Lindgren.

As you know, the subject matter of the evidence of both Drs. Welsh and Dr. Thompson is very much dear to the position of the Coalition, we spent a great deal of time in evidence discussing some of these very areas and hopefully highlighting the importance of them.

I was a little surprised to hear that my friend Mr. Lindgren is now adopting, as I interpret what he's saying, their evidence and saying it's consistent with their position. In the guise of a question Mr. Lindgren gave a small speech, and I feel it's appropriate - although I'm hesitant to jump on the band wagon - but under the circumstances it was felt inappropriate to cross-examine these witnesses today from the Coalition's point of view because in another hearing - and this is in force generally in many tribunals in the country - sweetheart cross-examination, in other words, people -- witnesses that hold positions that are so closely reflected to those that of the person who is cross-examining is prohibited.

And I'm standing to say this now only

because it was felt appropriate that the Coalition not proceed to cross-examine today, we felt that the evidence was too supportive or complimentary to the Coalition's position and since my friend Mr. Lindgren felt that it was appropriate to jump on the band wagon and say we adopt it, I'm going to say the same thing along those sort of lines. I thought that should be pointed out.

It is the Coalition that made reference to, in their terms and conditions, the 10 per cent retention of the oldest seral state, we've made reference to the various FEC types and how we should be looking at them and utilizing them at this time, and during the course of the nine weeks of evidence we referred to the pitfall of constraints or guidelines Mr. Lindgren has referred to in his little summation during cross-examination.

Madam Chair, I simply wish to point that out and that's the reason for our silence today. In that respect then, those are the reasons for our future silence as well.

MADAM CHAIR: Thank you very much, Mr. O'Leary.

We are running a little behind, so we're going to take our afternoon break now and come back and

hopefully conduct the scoping session for the Ministry of Natural Resources reply evidence 3 and 4 as quickly as we can.

MS. BLASTORAH: Madam Chair, we could just indicate to Dr. Welsh that he needn't stick around for that portion. Certainly my questions are done, I assume everybody else's are.

MADAM CHAIR: I think you're finished, Dr. Welsh. Thank you very much.

MS. BLASTORAH: Thank you.

---(Witness withdraws)

---Recess taken at 3:05 p.m.

---On resuming at 3:25 p.m.

MADAM CHAIR: Hello. Please be seated.

Hello, Mr. Freidin.

MR. FREIDIN: Madam Chair, if I might just bring the Board up to date on the issue which has appeared to have arisen from the Ministry of the Environment's statement of issues, and that was on the question of admissibility of a certain portion of Panel No. 4.

There's been a discussion between counsel for the Ministry, Forests for Tomorrow and Board counsel in that matter. Ms. Gillespie indicated that she felt in regards to the Board's -- pardon me, not

the Board's but Mr. Beram's letter of May the 11th that they respond in some way to the comment regarding that portion of the document dealing with the nature of the Class EA.

In the discussions that we've had we've come to an agreement, or I will report the results of it in this way: That there are no objections being raised by any of the parties to the admissibility of that evidence and, therefore, unless the Board had some concern about its admissibility and, therefore, wanted to hear submissions, it would be the intention of the Ministry then to, in accordance with I guess the agreement of all parties, to submit the witness statement in the usual course of events and, as we have indicated before, we limited evidence to all portions of it, including the portion which is authored by Mr. Bisschop.

So unless -- hopefully that's a satisfactory resolution of the matter for the Board.

MADAM CHAIR: That's fine, Mr. Freidin. In the letter of May 11th that went to yourself, the Board's concern simply was we didn't want to spend a lot of time in reply evidence going over the meaning of the Class EA and all those kinds of issues associated with it in reply and then revisit the entire thing all

over again in argument.

We're certainly prepared to hear your position and that of the other parties, but we're not going to do it twice. And so that was the intent, to let you know that we weren't questioning whether it should be put in, but we wanted it dealt with either here or later on.

MR. FREIDIN: Right. Hopefully the document is fairly clear so we wouldn't have to spend any time on certain portions of the evidence and it may be that we will spend some limited time focussing in on specific evidence, specific portions which are directly responsive to the positions taken by the parties.

The null alternative, response to that we may want to just sort of highlight that, but we don't intend to take a long time on any of this.

MADAM CHAIR: All right. Thank you, Mr. Freidin, Ms. Gillespie.

Were there any other matters that needed to be raised about these two reply witness statements?

MR. FREIDIN: No, I don't believe so. I perhaps should advise, in the discussion I had with Mr. Lindgren, you will note that the Forests for Tomorrow statement of issue indicate matters in dispute and then matters that they are going to cross-examine on.

Just so the Board's aware of what that means. There's an indication where it says matters in dispute, that doesn't mean they're going to cross-examine on them, they just wanted to go on the record as saying that these matters are in fact raised by the witness statement, we don't agree with them, we'll deal with it argument.

So they don't intend to cross-examine on the matters which they describe as matters in dispute, they only intend to cross-examine on the matters that they identify as matters for cross-examination.

MADAM CHAIR: Yes. And, Mr. Lindgren, by way of his letter of May 11 to you outlines what those matters are for cross-examination.

MR. FREIDIN: Right.

MADAM CHAIR: Okay. And how long do you think you will be, Mr. Lindgren?

MR. LINDGREN: One to two hours on Panel 3, one to two hours on Panel 4, probably on the short side.

MADAM CHAIR: Thank you, Mr. Lindgren.

Ms. Gillespie, do you have a sense of how long you're going to be in cross-examination?

MS. GILLESPIE: I would say about one to two hours in Panel 3, and Panel 4 we need to see the

interrogatory answers, but it shouldn't be more than two hours.

MADAM CHAIR: Thank you. And in examination-in-chief, Mr. Freidin, you're sticking to your one day?

MR. FREIDIN: Well, Panel 4 will be a day, probably less, but in that range.

Panel 3 is -- I think Panel 3 is going to run over a day, it's going to go a little more, about a day and a half, plus or minus a bit. It could actually take two, but I hope not, I hope we can finish it in a day.

MADAM CHAIR: All right, thank you.

MR. FREIDIN: I can deal with it.

MADAM CHAIR: Now, do you have your plans finalized for an addition to these four witness statements for reply evidence?

MR. FREIDIN: They are being worked on as we speak. We still hope to deal with it and provide that on schedule on June the 1st.

MADAM CHAIR: So for the purposes of scheduling there will be a fifth witness panel?

MR. FREIDIN: There will be. There will be, and --

MADAM CHAIR: Care to tip us off about

its contents?

MR. FREIDIN: I really can't tip you off on all of the contents because -- but I can tell you, obviously the whole issue of site productivity is going to be dealt with, a method, and I think when we move from Panels 2 and 3 to Panel 5, Professor Armson and Mr. Greenwood will be speaking to these issues.

Mr. Greenwood will be speaking growth and yield at the same time, and that evidence will also be responding to OFAH's case in terms of what they do and don't do in British Columbia.

There's going to be a section responding specifically to Forests for Tomorrow's silvicultural standards.

MR. LINDGREN: Called guidelines, Mr. Freidin.

MR. FREIDIN: I'm sorry, guidelines.

MR. MARTEL: We got agreement today on everything. Didn't you hear it, I did.

MR. FREIDIN: That's still just off the top my head.

MADAM CHAIR: All right. Thank you, Mr. Freidin. We haven't asked you, have you finalized the witnesses who will be appearing in Panels 1 through 4?

MR. FREIDIN: Well, we certainly

finalized almost 1 and 2, 1 and 2 will be Mr. Kennedy and Mr. McNicol, No. 1 -- sorry, No. 1 will be Mr. Kennedy and Mr. McNicol.

No. 2 will be - I don't have a list here - Mr. Kennedy, Paul Ward, Robert Steidman, speaking to the fish habitat guidelines local effectiveness monitoring, Ken Abraham speaking to the moose guidelines environmental effectiveness monitoring program. Dave Gordon might be a witness on Panel 2.

MR. MARTEL: It's starting to sound like a football team.

MR. FREIDIN: Right. Do you want me to guess at Panel 3. Tell you what, why don't I prepare a list and you can circulate it to the parties.

MADAM CHAIR: Thank you. So so far there will be only two witnesses we haven't heard from before, Paul Ward and Robert Steidman.

MR. FREIDIN: Paul Ward.

MADAM CHAIR: Paul Ward.

MR. FREIDIN: Paul Ward and Robert Steidman. Paul Ward, his paper on --

MADAM CHAIR: Yes.

MR. FREIDIN: Oh, Mr. Waito will be a witness in Panel No. 2 speaking to the committee report I think.

MR. MARTEL: Five more to go to round out the roster.

MS. BLASTORAH: We're going to have bleachers again, Mr. Martel.

MR. FREIDIN: There are a few witnesses in Panel 3 that you will not have seen before.

MADAM CHAIR: All right.

MR. FREIDIN: I think there are six witnesses.

MADAM CHAIR: In Panel 3?

MR. FREIDIN: And you will again see -- Panel 3, you'll be seeing some old faces. Dr. Osborn will be back. Mr. Kennedy I think appears in every panel, not by choice.

MADAM CHAIR: He always does.

MR. FREIDIN: Not by choice. And I think that's about as far as I should go.

MADAM CHAIR: Okay, fine.

MR. FREIDIN: We're not calling the Minister, of course.

MADAM CHAIR: Okay. Do you have anything else?

MR. MARTEL: No.

MR. PASCOE: By my calculations we may very well be completed MNR reply Panel 4 by the 18th of

June, in which case the scoping session for Panel 5 is currently set for Monday, June 22nd. We may very well consider moving that back to the 17th, as well as moving the date for the submission of statements of issues to the 17th as well.

MADAM CHAIR: And June 1st -- there's a June 1st date in mind to submit Panel 5.

MR. FREIDIN: Yes.

MR. PASCOE: And the 8th was the day set to submit interrogatories, and the 15th was the date set for MNR to provide their replies. If it works out that we are in fact finished with 3 and 4 by the 18th, it may be a good idea to have the fifth one scoped on the 17th so we can begin on the 22nd.

MADAM CHAIR: Mr. Pascoe, why don't you work with the parties on setting whatever is an achievable date for scoping the Panel 5 evidence.

All right. Then is there anything else to discuss today? (no response)

No. Okay, thank you very much. And we will be back tomorrow morning at nine o'clock.

---Whereupon the hearing was adjourned at 3:35 p.m., to be reconvened on Thursday, May 28th, 1992, commencing at 9:00 a.m.